The IRON AGE

May 15, 1958

A Chilton Publication

The National Metalworking Weekly



What Tool and Die Barometer Forecasts For Business P. 31 "Packaged" Equipment
Gains in Slow Market - P. 36

Control Porosity
In Aluminum Castings — P. 71

Digest of the Week P. 2-3



Standard Ex-Cell-O Machines Handle Automatic Operations

Take these cam boring machines, for example: they are standard Ex-Cell-O 312s. When a customer's production schedule called for an unusually high per hour output of steel gear blanks Ex-Cell-O engineers incorporated these machines into an automated setup.

achining is completed

Included in the new setup: two cam-operated Ex-Cell-O Precision Boring Machines, two Gear-O-Mation storage-distribution units, three gaging stations.

The boring machines finish all the surfaces of the gear blanks: face both sides, chamfer both inner and outer edges, bore the central holes and turn the outside diameters. Tools are adjusted automatically to maintain required tolerances. Gage units automatically check parts prior to entering the machining stations, and the storage-distribution units provide space for a bank of parts at each machine station.

If you're interested in automation, but are held back by the high cost of specially designed machine tools, call your nearby Ex-Cell-O Representative today. Perhaps a standard Ex-Cell-O machine tool setup can be adapted to your automatic operation requirements. Or, if you prefer, contact Ex-Cell-O in Detroit directly.



MANUFACTURERS OF PRECISION MACHINE TOOLS * GRINDING AND RORING SPINDLES * CUTTING TOOLS * TORQUE ACTUATORS * RAILROAD PINS AND BUSHINGS * DRILL JIG BUSHINGS * AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS * DAIRY EQUIPMENT

Another New Skyscraper in New York with Bolted Steel Framework



Owner and builder: Tishman Realty & Construction Co., Inc.; Architect: Carson & Lundin; Structural engineer: Victor Mayper; Fabricator and erector: Bethlehem Steel Company.

This is 666 Fifth Avenue, an office building destined to be one of the better known addresses in New York City. The 39-story structure has a 13,300-ton steel framework, the structural members of which are joined with thousands of Bethlehem High-Strength Bolts.

666 Fifth Avenue occupies the west side of the avenue between 52nd and 53rd Sts. This air-conditioned structure has a 14-story base and a 25-story tower. White porcelain mullions, set in narrow frames of polished aluminum, extend the full height of the building exterior.

Look at these advantages of Bethlehem High-Strength Bolts!

- Save time. Bethlehem High-Strength Bolts save time in steel erection because they can be installed readily by ironworkers, using powerdriven wrenches.
- Tight, sound joints. The bolts are used with two hardened washers, one under the head, the other under the nut. When tightened carefully, the bolts produce high clamping power.
- 3. Installed cold. There's no chance of fire, no danger from tossed rivets which miss the target.
- 4. Less noise. Their use is relatively quiet. Highstrength bolting is ideal for joining structural steel in hospital and school zones.
- Meet ASTM Spec. A-325. Bolts are of carbon steel, and are quenched and tempered to meet the requirements of ASTM Specification A-325.
- 6. Full size range. They meet every construction need. Full details can be obtained from the Bethlebem sales office nearest you.

BETHLEHEM STEEL COMPANY BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation, Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL



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May 15, 1958-Vol. 181, No. 20

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NEWS ARTICLES

UNIONS STRESS POLITICS

A Shift in Strategy - Recession and public resentment have put union leaders on the defensive. It's a cinch they will step up politicking to hold gains.

NEW BRONZE BEARING

Impresses Railroads - A new cartridge-type bearing made for freight cars is gaining wider use. The manufacturer, American Brake Shoe, built it to give users longer bearing life with a minimum of maintenance. P. 39

NICKEL

Hassle Over Ore-The government would like to cut the rates it pays for ore for its Nicaro smelter. But the supplier, Freeport Sulphur Co. is standing fast, and the government may lose ground. P. 40

AUTOMATION JOBS

Workers Sound Off - Machine operators at a Detroit engine plant give frank opinions about their new. automated jobs. Surprisingly, a majority prefer automation to conventional machines. P. 49

METALS SUBSIDIES

Tough Fight Ahead-Administration's plan to head off higher tariffs and quotas by supporting some metals prices faces tough

Metalworking

LOOKING AHEAD: Tool and die makers get the first look at industry's plans for the future. And their orders can be a reliable business barometer. Photo on cover shows workman at Ehrhardt Tool and Machine Co., St. Louis.

P. 31

going. Almost every point has some strong group opposing it. P. 53

MISSILE SUBCONTRACTING

The Field's Wide Open—"Sell your abilities to contractors and the Air Force," missile buying boss of Air Materiel Command urges small firms. A good part of the missile dollar is spent on ground support equipment.

P. 55

FEATURE ARTICLES

ALUMINUM CASTINGS

How to Prevent Porosity—Small voids loom large in terms of strength, wear-resistance or ability to contain hydraulic pressure. A detailed study of aluminum casting methods and their influence on porosity has resulted in some guiding rules for guaranteeing castings of proper density.

P. 71

TUBE DRAWING

New Ideas Boost Mill Output— A new drawing process and mechanized handling have turned an obsolete mill into one of the most efficient. While production has increased 50 pct, floor space needs have been cut by 40,000 sq ft.

P. 75

X-RAY MEASUREMENT

For Blind Dimensions—A lead sheet masks out all X-rays except a narrow beam. By sweeping the part to be measured and the film beneath it through the beam, the

film is exposed only to vertical X-rays. The result is a picture in a 1:1 ratio.

P. 78

PORTABLE NIBBLERS

Tools for Odd Jobs—Weighing only 8 to 13 lb, these little handhold punch presses will cut metal sheet up to 3/16 in. thick. Vibration keeps the tool moving ahead to take rapid bites.

P. 81

LAMINATED PLASTICS

How to Machine — This concluding article of a three-part series covers screw machine and turret lathe work. Also discussed are planing and shaping, punching, shaving, broaching, postforming, finishing and marking. P. 106

MARKETS & PRICES

PACKAGED EQUIPMENT

Gains Steadily—The market for packaged, or pre-built, industrial equipment is growing fast. These units have many advantages including lower cost, quick installation, and interchangeability. P. 36

ADHESIVES

Markets Still Growing—Before World War II, sales of structural adhesives to metalworking were about \$100,000 annually. This year they'll be about \$17 million. P. 35

L-P GAS

Extends Its Markets—The L-P gas industry, now grossing about \$3 billion a year, has grown steadily for 27 years. It hopes to expand as an over-the-highway fuel. P. 38

DETROIT STEEL JITTERS

Automakers Are Nervous—Low steel inventories are giving auto builders a bad case of nerves. They're sounding out the mills on the prospects for quick delivery should the market show improvement.

P. 115

NEW HAND TOOLS

Users Get Wide Choice—Makers of hammers, files, and wrenches are providing buyers with a large selection of new and improved products. Despite recession, producers are confident about sales outlook during rest of '58. P. 116

NEXT WEEK

CUT CARBURIZING TIME

With High Temperatures—From a cost standpoint, this could be the trend of the future. Next week's feature is a first-hand report on new carburizing cycles at 1800° and 1900°F that actually cut furnace time in half.





B&W

Quality-Controlled Tubing

is matched to the application

From raw materials to finished tube, quality depends upon control and "know-how." And when it comes to matching the one right tube, of the hundreds of possibilities, for a particular end use application, it takes specialized equipment and experienced technicians.

For instance: If corrosion is a problem — will a steel with a particular heat treatment do the job? If the tube is unusually long and

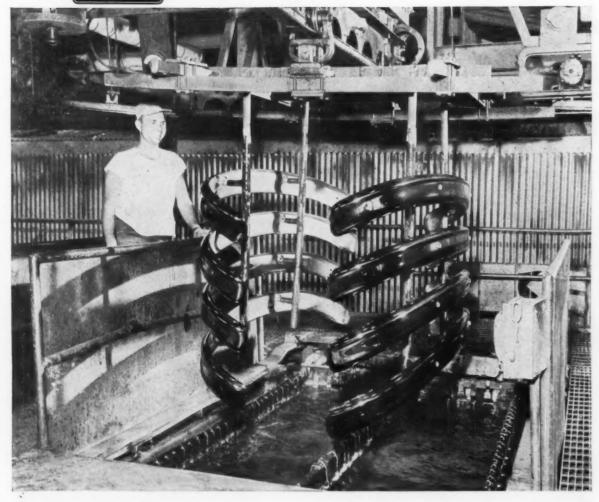
center welding is employed to achieve length—is the joint completely satisfactory? If the tube must have a special soundness quality—is it free from hidden or invisible defects?

These are but a few of the quality control checks which insure that the tubes you buy from B&W are as near perfect in terms of performance as it is possible to make them. When you need stainless, carbon or high alloy tubing — for pressure or mechanical applications — you can rely on Mr. Tubes and B&W to supply the best. Write for bulletin TB-420 — The B&W Quality Control Story. The Babcock & Wilcox Co., Tubular Products Division, Beaver Falls, Pa.



Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

B.F.Goodrich



Shiny faces for a bumper crop

B. F. Goodrich product improvements brought extra savings

Problem: Those curved pieces of steel will soon be gleaming bumpers on new automobiles. They're about to be dunked into a plating solution that gives them their shiny chrome finish. But the acid used is so corrosive it would eat holes through metal tank walls.

Acid leaks, high maintenance costs were the result. Tanks were lasting five years at the most, sometimes only three. What was done: A satisfactory tank seemed impossible until B.F.Goodrich

developed Koroseal flexible material that can stand practically all acids. Six tanks were lined with B.F.Goodrich Koroseal.

Savings: That was eight years ago—and that was the end of acid leaks and the other troubles the bumper manufacturer had been having. These Koroseal-lined tanks are still in use, helping turn out as many as 12,000 bumpers a day. On other plating lines in this plant, B.F. Goodrich rubber-lined tanks

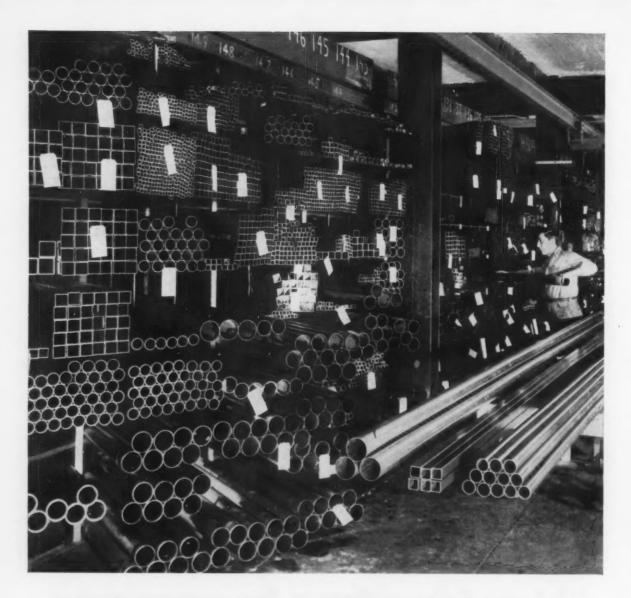
have had 12 years of trouble-free service.

Why specify B.F. Goodrich: When you select B.F. Goodrich-lined equipment to handle acids and other corrosive chemicals, you get the benefit of specialists who have years of experience in this kind of work. You can be sure that the lining B.F. Goodrich recommends, produces and installs for you will meet all the special requirements of the job to be done. For more information, write B.F. Goodrich Industrial Products Co., Dept. M-322, Akron 18, O.

Koroscal-T.M.Rog. U. S. Pat. Off.

B.F. Goodrich industrial products

THE IRON AGE, May 15, 1958



The type of tubing you need is here

It pays to analyze your tubing requirements with a Ryerson tubing specialist. He is well qualified to help you select the right tubing for your purpose from Ryerson's diversified stocks.

The Ryerson specialist knows tubing—knows what will work best and why. In many cases, he can

recommend a type that will do a better job for you—perhaps a newer type that will save you money, either in first cost or in the cost of using it.

Ryerson carries the nation's largest stocks of steel tubing—all of certified quality—and uses the finest modern equipment to cut to your exact specifications. And Ryerson delivers fast—one tube or a thousand.

The Ryerson tubing specialist is as close as your telephone. Give him a call today.



RYERSON STEEL

Member of the TAND Steel Family

Tubing in stock: Seamless and welded mechanical tubing; fluid line, pump cylinder and structural tubing; stainless pipe and tubing; PVC pipe and fittings. Also, aluminum tubing in many plants.

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK · BOSTON · WALLINGFORD, CONN. · PHILADELPHIA · CHARLOTTE · CINCINNATI · CLEVELAND DETROIT · PITTSBURGH · BUFFALO · INDIANAPOLIS · CHICAGO · MILWAUKEE · ST. LOUIS · LOS ANGELES · SAN FRANCISCO · SPOKANE · SEATTLE

The Positive View It's Time to Take It Now

The recession is beginning to bottom out. It isn't capricious to think the worst is over.

Many businessmen have shown courage and a lack of hysteria. This calmness has been hidden at times by the boisterous nervousness of a few. Even though some of this matter-of-fact attitude may be fearlessness based on lack of bitter experience, it may be industrial maturity.

No matter what it is, it is a good thing in itself. It has prevented mass hysteria and it has pointed up the need to approach "buy now" programs with caution and commonsense. When prodded unduly to buy this or that we often stop to consider the whys and wherefores. Then there is danger that we will react the opposite from what the "sponsors" had hoped for.

But there is something in today's picture which packs more wallop than looking for an upturn and worrying about keeping afloat. Those who are still afloat will stay that way; those who aren't will get another chance.

There has been much talk about our progress. Maybe it's true, especially in our laboratories and in our pilot plants-and generally in our up-to-date equipment. But we have a long way to go before we fight inflation and excessive wage

boosts adequately with higher productivity by everyone.

Machinery has been kept too long. We procrastinate by hanging onto things long after they should be replaced. We are timid about taking chances on new products. Our Government robs our progress by a slow motion depreciation allowance-this puts a premium on antiquity and "safe" methods.

Higher wages and prices have brought us to the crossroads. We must halt excessive wage increases. We must boost our productivity to hold down prices and achieve an even better distribution. And we must foster more capital investment, liberal techniques, plant and equipment primarily for performance, and realistic depreciation.

We are literally galloping toward new horizons. It is true to say "we haven't seen anything vet." Homes, buildings, cars, gadgets, electronics, and atomic research have but scratched the surface.

We are still dragging our feet. This year is but a temporary roadblock to a future with fantastic progress along all industrial lines. But we have to think and act positively, else we get bogged down by our own miserable outlook.

Tom Campbell

Editor-in-Chief



No matter how "smart" they make the machines, it still takes men to run them

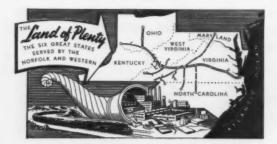
When the holes in a die must be accurate to 2/10,000 of an inch, there's no substitute for men who know how to use precision machines. Men like Denver Haney, above, a machinist for The Mechanical Development Co., Inc. in Salem, Va., makers of dies and tools for all types of manufacturing, including atomic reactor parts.

Denver Haney is representative of the pool of highly skilled workers in *The Land of Plenty*, men with sound technical backgrounds and valuable on-the-job experience. More and more, the job opportunities and desirable living conditions in this great and growing industrial region are attracting highly skilled men.

If you're planning a new plant and need workers with technical know-how, the place to begin looking for your plant site is in the progressive six-state area served by the Norfolk and Western. There are many superior manufacturing advantages here. Let the N&W's plant location specialists tell you about them — in confidence and without obligation.



L. E. Ward, Jr., Manager Industrial and Agricultural Dept. Drawer IA-793 (Phone Diamond 4-1451, Ext. 474) Norfolk and Western Railway Roanoke, Virginia



Norpolkand Western

About That Summit

Sir—"The Summit Gimmick" by Tom Campbell in your May 1 issue is by far the most logical and crystalized explanation of Communist double-thinking I have ever seen in print.

It is unfortunate that this editorial cannot be placed in the hands of each and every American. I am sure it would help us all to think clearly in the face of our statemen's conflicting opinions in dealing with Khrushchev and Company.

I don't think a plateau exists where Democracy and Communism can agree on any issue.

—E. J. Korey, Vice Pres., Bud Radio, Inc., Cleveland.

Tax Cutting

Sir—Your editorial in the Apr. 17 issue re tax cutting schemes vs. responsible planning expresses my thoughts exactly. I would appreciate permission to make a few copies to send to Congress with a letter offering my opinions as to what constitutes appropriate tax revision.

It would appear that we largely agree; but we should recognize that some people may propose allowances, exemptions, and exceptions honestly even though based on misinformation or misunderstanding. Even our opinions may be subject to such fallacies; still it is our right and duty to communicate with our legislators, particularly when issues seem more crucial than usual.—W. D. Calhoun, La Crescenta, Calif.

· Permission granted.—Ed.

Proper Photo Credit

Sir—In the article "Tips on Spinning Stainless Parts" (IRON AGE, Apr. 3) you incorrectly attributed the photograph used to the De Laval Steam Turbine Co.

Actually it was taken at the De Laval Separator Co. Both the photo and much of the information in the article originated with our company. We are pioneers in compression spinning, having developed the machine in order to make special disks for one of our products. We have been doing this type of work since the late 1920's.

—J. H. Bronson, Adv. Mgr., De Laval Separator Co., Poughkeepsie, N. Y.

 Sorry for the error. Hope this sets things straight.—Ed.

Nonferrous Machining

Sir—Can you please send us three copies of the article "How to Get More for Your Nonferrous Machining Dollar" as printed in the Apr. 24 issue of The IRON AGE.

Receipt of this article would be very beneficial to our machining and production departments as we are now engaged in machining nonferrous metals.—C. A. Roesch, American Motors Corp., Special Products Div., Detroit.



"Jenkins, I'm afraid this coffeebreak business is getting out of hand!"



Whatever your cleaning job may be, there is a size and type of Malleabrasive shot or grit of a specialized hardness to do your job best.

Whether you use centrifugal ar air-blast cleaning equipment—whether you want shot finish or grit finish— whether you clean steel, gray iron, malleable, bronze or aluminum, whether for cleaning before surface coating, enameling, metallizing, galvanizing, you can have in Malleabrasive the right type to do it best.

The full and complete Malleabrasive process—used by us exclusively—enables us to combine the toughness of malleable iron with various degrees of hardness to produce abrasive "tailored" to your special needs.

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think of brass...
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* Sheet and Strip Specialists in Brass and Copper *

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FATIGUE CRACKS

Belated Thanks

Our cover on the April 24th issue had only one flaw. We neglected to identify the company making it possible. That was especially un-



fortunate because they were very cooperative in helping us get the needed pictures.

So to ease our conscience: Here's the photograph again. The machinist is working on a copper alloy medallion. And he's employed by the Medallic Art Co., 325 E. 45th St., New York City.

Designer's Delight

Out of our mail recently popped this unsigned, tongue-in-cheek tribute to the draftsman. We're grateful for the contribution, happy to publish it, and unwilling to admit it's ever true.

The Draftsman

The draftsman bent across his board,

Wonderful things in his head were stored.

And he said as he scratched his throbbing bean,

"How can I make this thing hard to machine?"

Now, if this thing here were near the gate,

I know the thing would work first rate;

But it would be so easy to ream and bore,

It would never make the machinist sore."

Now I'll put an angle over there, Then watch those babies tear their hair.

Next, I'll move the holes that hold the cap

Way down here where they're hard to tap."

Then he stepped back to view his luck.

"It can't be held in a vise or chuck; It can't be milled and it can't be ground;

In fact, the design looks exceedingly sound."

He looked again—Ah! Success at last!

"The blamed thing can't even be cast."

-Author unknown

Mutilated Matadors

How can aluminum help battleweary bullfighters? Give up? Well, it's an interesting story about an aluminum market certain never to get into the high tonnage class. Alcoa's Aluminum News-Letter advises that old matadors whose sword arms have been punctured by overzealous bulls needn't throw in the cape.

To offset any arm weakness, bullfight officials have o.k'd the use of swords made of lightweight aluminum in place of the traditional steel blades. It won't make much difference to the bulls. However, veteran bull - dodgers previously near the end of the line will again know the thrill of outmaneuvering el toro.

Puzzler Winners—More winners of Amoeba puzzler (April 10)— James M. Chorak, 2nd Lt., USAF; and Susan Silvey, Brooklyn, N. Y.



PICKLE TANKS COST LESS LAST LONGER



... compared to expensive alloys!

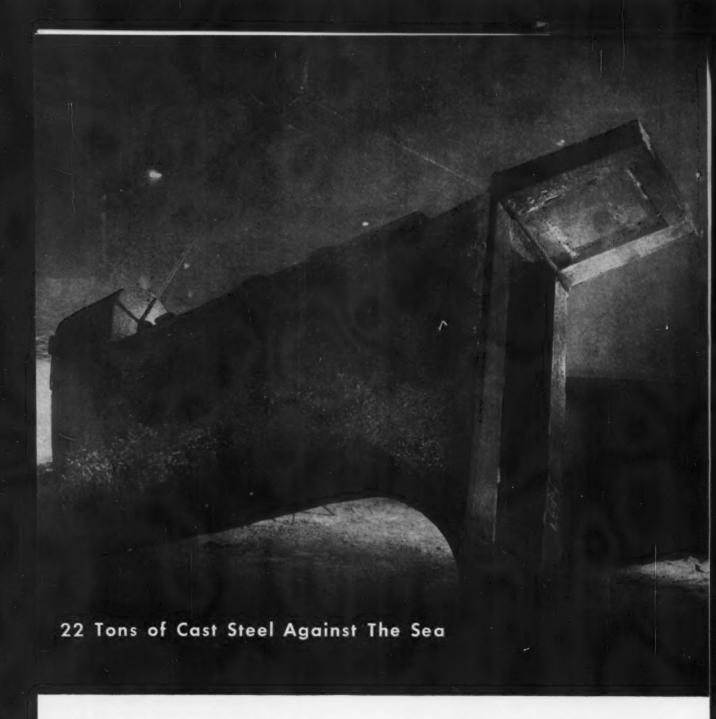
Today in the light of ever increasing costs, Atlas offers you economical pickle tank construction that will give you longer trouble free life. This is accomplished by the use of a mild steel or concrete shell protected by corrosion-proof linings and acid-brick sheathing joined with corrosion-proof cements. These Atlas tanks are impervious to today's stronger pickling solutions and higher operating temperatures. A wide choice of cements is available, each best suited for a specific condition.

Atlas construction is far less costly to install than expensive alloys. In addition Atlas tanks are corrosion-proof inside and out and are engineered to withstand hard physical abuse from shifting loads.

For a lower initial cost, longer life expectancy and complete protection against corrosion, see Atlas first.

Write for Atlas Bulletins 5-2 and C-1.





ERIE FORGE & STEEL cast steel ship's stern frames meet and beat the stern challenges of the seven seas . . . steel castings bred and born to survive Neptune's furious tempers against maritime and naval shipping. Like the men who for centuries have mastered the sea, these cast steel components boast the rugged strength, the inborn quality to win the coveted "well done" on every voyage.

Casting and forging dependable ship's components and vital parts for industrial machines is a long-time habit at Erie Forge & Steel. A habit combining strict quality control from raw materials to finished casting, long experience in producing steel castings to exacting specifications, modern metallurgical, engineering and production methods . . . Procedures that assure the results you expect. Consult with us.

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ERIE, PENNSYLVANIA

MEMBER AMERICAN IRON AND STEEL INSTITUTE

COMING EXHIBITS

Foundry Show-May 19-23, Public Auditorium, Cleveland. (American Foundrymen's Society, Golf & Wolf Rds., Des Plaines, Ill.)

Packaging Show-May 26-30, Coliseum, New York. (American Management Assn., 1515 Broadway, New York 36.)

Materials Handling Show-June 9-12, Public Auditorium, Cleveland. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Automation Show-June 9-13, Coliseum, New York. (Richard Rimbach Associates, 845 Ridge Ave., Pittsburgh 12.

MEETINGS

Industrial Heating Equipment Assn., Inc.—Spring meeting, May 18-21, The Homestead, Hot Springs, Va. Society headquarters, 1145 19th St., N. W., Washington, D. C.

American Electroplaters' Society-Annual convention, May 18-22, Sheraton-Gibson Hotel, Cincinnati. Society headquarters, 6265 Wiehe Rd., Cincinnati.

Non-Ferrous Founders' Society-Annual meeting, May 19-21, Carter Hotel, Cleveland. Society headquarters, 1604 Chicago Ave., Evanston, 111.

Farm Equipment Institute-Spring industry meeting, May 22, LaSalle Hotel, Chicago. Society headquarters, 608 S. Dearborn St., Chicago 5. III.

Air Pollution Control Assn.—Annual meeting, May 25-29, Sheraton Hotel, Philadelphia. Society headquarters, 4400 Fifth Ave., Pittsburgh 13.

JUNE

American Gear Manufacturers Assn. -Annual meeting, June 1-4, The Homestead, Hot Springs, Va. Society headquarters, One Thomas Circle, Washington, D. C.

(Continued on P. 16)

When it comes to Superior Barrel-Finishing Equipment

only Speed-D-Burr gives you these ... "dollar saving" **EXTRA FEATURES** at No Extra Cost!



Low Voltage Electronic Control Panels used in Speed-D-Burr Barrel Finishing Equipment are conveniently located for easy, quick, effort-less accessibility . . . no reaching, no fumbling, no accidents!

Starting may be instantaneous or delayed; manual or preset start-or-stop timer eliminates need for close time-cycle supervision. Accurate automatic timing — just set the time cycle and forget it! Positive-action variable speed control governs rpm of barrel as registered on a large easy-to-read tachometer. Safety reset switch prevents unexpected starting. Forward and Reverse jog switches allow easy barrel positioning. Motor, transformer, low voltage controls, overload protection and all other controls are completely enclosed to prevent saturation from water or other contaminants.

You are paying for a complete machine Be sure you get one!

Check features and cost of unit delivered in your plant!

HINGED BARREL DOOR

Quick acting cam locks reduce opening and closing time by 90%. Prevents improper door replacement or accidental droppage.

GREATER BARREL CAPACITY IN ALL SIZES

Compared with the nearest competitive equipment the SPEED-D-BURR barrels offer 10 to 18% GREATER CAPACITY.

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Gives smoother stopping with less wear and tear on equipment — thus practically eliminating maintenance costs.

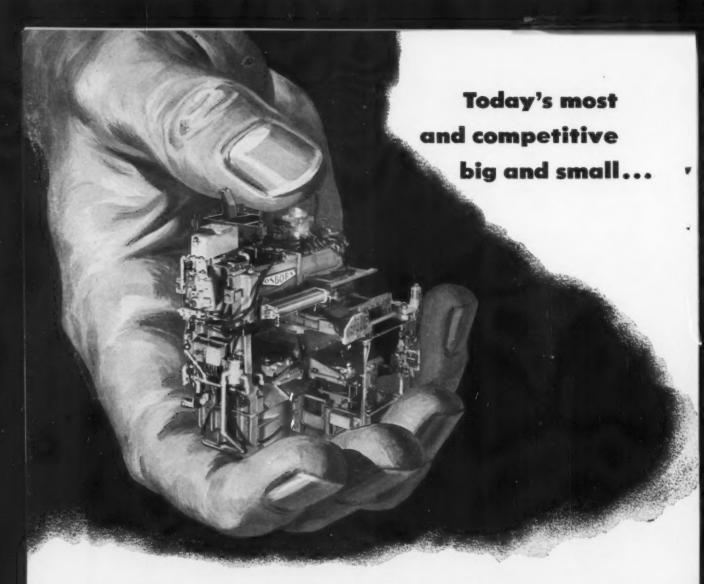
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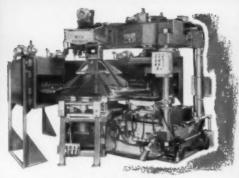
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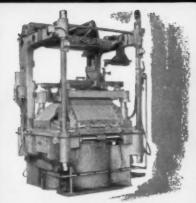


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EXHIBITS, MEETINGS

(Continued from P. 13)

Institute of Appliance Manufacturers—Annual convention and exhibit, June 2-4, Netherland Hilton Hotel, Cincinnati. Society headquarters, Shoreham Hotel, Washington, D. C.

The American Nuclear Society— Annual meeting, June 2-5, Statler Hotel, Los Angeles. Society headquarters, P. O. Box 963, Oak Ridge, Tenn.

Pressed Metal Institute — Management meeting, June 4-5, Hotel Carter, Cleveland. Society headquarters, 3673 Lee Rd., Cleveland.

The Commercial Chemical Development Assn. — Spring meeting, June 5-6, Hotel Niagara, Niagara Falls, N. Y. Society headquarters, 60 E. 42nd St., New York 17.

American Boiler Mfrs. Assn. and Affiliated Industries—Annual meeting, June 8-11, Skytop Lodge. Skytop, Pa. Society headquarters, 4062 Mayfield Rd., Cleveland.

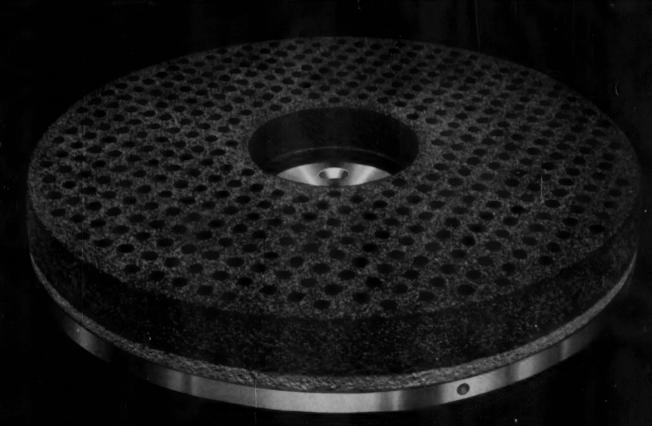
Malleable Founders' Society—Annual meeting, June 9-10, The Homestead, Hot Springs, Va. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

American Foundrymen's Society— Annual foundry instructors seminar, June 19-21, Castle Institute of Technology, Cleveland. Society headquarters, Golf & Wolf Rds., Des Plaines, Ia.

Alloy Casting Institute — Annual meeting, June 21-24, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

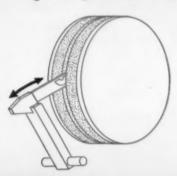
American Society for Testing Materials — Annual meeting and exhibit of scientific apparatus and laboratory supplies, June 22-27, Hotel Statler, Boston. Society headquarters, 1916 Race St., Philadelphia.

Industrial Safety Equipment Assn., Inc.—Annual meeting, June 24-27, Oyster Harbors, Osterville, Mass. Society headquarters, 420 Lexington Ave., New York.



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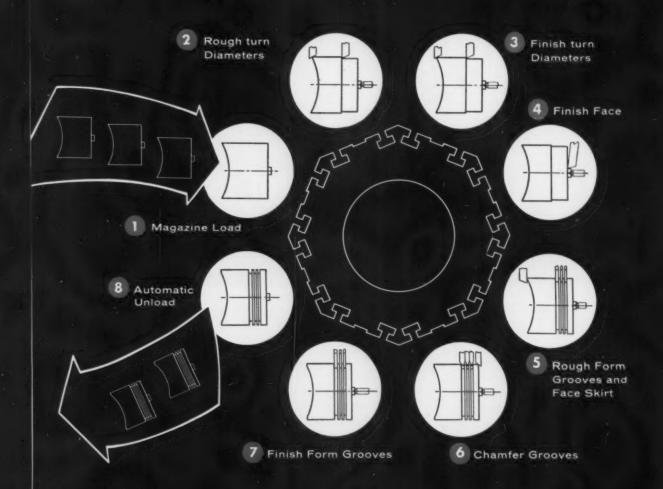
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Yes, when it comes to cutting costs Bellows Air Motors are a production man's best friends. They put practical automation within easy reach of every plant in every industry.

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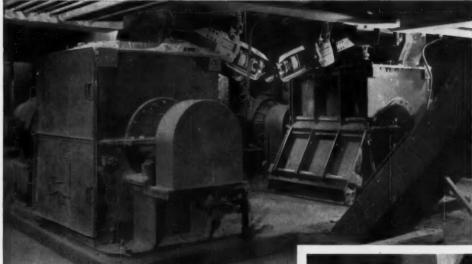
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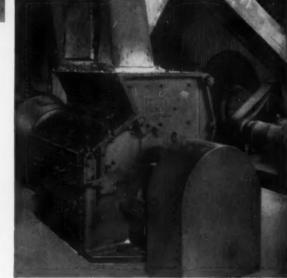
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Even the smallest-size Heroults have big electric furnace features!

Now, while you've got time to catch your breath, is a good time to take a searching look at your foundry facilities. In the face of the obviously keener competitive period ahead, wouldn't you be smart to modernize your melting equipment—to switch to electric furnaces—and be ready for the business upturn that's coming? You can install a Heroult now with minimum inconvenience to plant operations.

The Heroult Electric Furnace helps you produce better-quality steel . . . faster . . . and more economically

Available in standard sizes of shell diameter ranging from 7'0" on up, and with capacities of from $1\frac{1}{2}$ tons up to 200 tons, the improved Heroult is unquestion-

ably the finest electric melting furnace on the market. The features listed below are found in all standard Heroult's—even the smallest.

The Heroult Furnace is 100% mechanically operated.

It includes such mechanical features as: heavy rack-andpinion-type tilting mechanism; mechanical roof lift; motordriven, rotating, jib-type roof swing; winch-operated, watercooled jib-type door-lifting mechanism; and high-speed, electro-mechanical electrode-positioning mechanism.

Another exclusive—cage-type shell construction with shell plates clipped to a heavy supporting structure. This construction minimizes shell warping and allows easy replacement if shell plates are damaged.

Exclusive—Operating Mechanism Independently Supported.

The tilting platform on which all operating mechanisms are supported is attached directly to the rockers independent of the shell structure. Thus operating mechanisms are unaffected by any shell distortion.

Exclusive-Flat-Bottom Shell.

This feature facilitates easy shell relining and provides maximum protection against burnouts. Thicker refractory at the sides of the hearth promotes more uniform bath temperature.

Exclusive-Water-Cooled, Skew-Back Roof Ring.

This feature eliminates the need for special skew-shaped roof refractories.

Electrode Mast Safety Device.

This spring-loaded, rack-and-pawl-type device provides positive protection against damage resulting from electrodewinch cable breakage.

Square-Sectioned, Water-Cooled Electrode Mast Arms.

This design guarantees a rigid connection between mast and mast arm, thus helping to maintain proper electrode position and alignment.

Remote-Controlled Electrode Clamps.

This device, of the spring-clamp, air-release type, is located inside of the rear section of the water-cooled mast arm where heat cannot affect it.

Square-Sectioned Electrode Mast.

This design feature, developed by American Bridge, assures proper guiding and electrode positioning.

Rockers.

The heavy fabricated steel curved top and bottom rockers minimize forward travel during tilting. The furnace will return to charge position from any degree of tilt due to designed center of gravity.





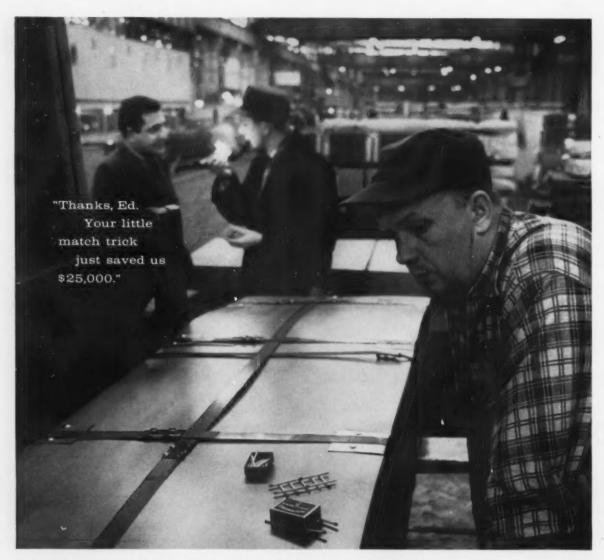
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Please send me a copy of the latest Heroult Electric Furnace catalog and/or folder showing large drawing with special installation and engineering data _.



Changing to a seemingly more efficient method may not always add up to the best answer. For example, new packaging instructions solved a handling problem for a large user of cold rolled sheets, but created a new problem by adding about \$3 per ton to their steel cost.

Their lifts of steel had been coming in on crosswise skids, and when the fork-truck picked them up the ends sagged. This made handling difficult and hazardous. To overcome this problem they decided to have their sheets packaged on solid platforms which would provide support. This solved the handling problem, but the added cost bothered Ed Robinson-one of Inland's packaging and loading specialists.

Visiting the user's plant, Ed watched the unloading

operation and came up with another idea, which he demonstrated with matches: "Why not order your sheets packaged on lengthwise skids?" he asked. "Inland's shipping department will place wood blocks on the truck bed before loading your steel. Then your fork lift truck can get under the lifts easily-and you won't have to pay extra for special platforms."

Some people might call Ed's concern a bit out of the ordinary. At Inland we think of it as normal follow-through. Whether it's help in specifying the right kind of steel for the job, advising on production procedures or aiding with material handling, Inland's sales and field representatives are constantly working to provide their customers with a complete steel service.

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Pictures on a Pinpoint

A novel photographic technique makes use of a superfine emulsion to make miniature negatives as small as 0.005 x 0.007 in. When viewed under a microscope, a page of printed matter shrunk to this size is just as legible as the original page. Already adapted to the production of measuring scales, the process suggests other uses: for example, smaller-than-ever microfilms of drawings and documents.

High Heat for Carburizing

Recent tests with 4620, 8620, and 9310 prove the feasibility of high-temperature carburizing (up to 1900°F), especially for heavy case applications. Even at 1800°F, the normal 12-hour carburizing cycle can be cut to 6 hours to provide equivalent case depth. These results confirm earlier Russian reports. Adoption of the high-temperature method on a production basis can be expected in the near future.

Shell Cast Savings

A major automotive manufacturer reports savings of 300,000 lb per melt on crankshafts. It's the result of changing over to the shell casting process. Additional benefits come from ease in finish machining.

Cards to Take Over Shop

Based on the use of punched cards, an ultratight shop control program will begin next month. Involving about 4200 different setups per month with lead time varying from ½ to 4 days, 100 machines will be so closely controlled that reprogramming of monthly schedule can be done in 3 days. Efficiency studies can be run continuously at 3-day intervals.

Lengthen Fatigue Life

In a unique fatigue test of Cr-Ni-Mo steel, experimenters find that interruption of the test doesn't influence the life of the test piece if the

material is non-aging. When a thin layer of metal is machined during the interruption of the test, endurance is increased considerably. Eight surface layers were removed from the same sample during successive interruptions to produce a total increase in endurance of 633 pct.

Units to Plan Own Future

Today's computers may get a chance to plan their own future. Electronic men are playing with the idea that current units will design their own successors. Computors will store up experiences and will profit by their own mistakes and problems in designing improved models.

Contracts to Small Firms?

Politicians battle over why more small firms aren't awarded prime contracts to build missiles and rockets. Pentagon planners claim that most small firms aren't capable and that the 2 pct awarded to small business is a fair share. But the Small Business Administration and some individual congressmen intend to keep nagging the Pentagon to award more prime contracts to small business.

Turbine Blades from Strip

A new turbine-blade processing machine goes through forming, welding and inspection steps to produce hollow blade assemblies from flat strip. Automatic welding and 100-pct electronic inspection insure uniform quality even on small quantity runs.

Nitriding Boosts Ti Use

A modification of the nitriding technique has attained the best results ever on titanium. The process: nitriding at 1800°F in dry, chemically-pure nitrogen. It works as well with titanium alloys as it does with the commercially pure metal. Virtually any case depth can be achieved. The development could greatly extend the usefulness of titanium in many high-temperature applications.



Machining speeds tailored to wide variety of metals with Cleveland Speed Variator

In the manufacture of aircraft engine components, Cleveland Speed In the manufacture of aircraft engine components, Cleverand Sp. Variators permit fast, accurate adjustment of machining speeds variators permit rast, accurate adjustment or machining speeds to the exact rpm required for various metals from magnesium

Infinitely variable, the Speed Variator provides continuous speed Infinitely variable, the Speed variator provides continuous progressions over its full 9:1 range . . . from 1/2 to 3 times progressions over its init 9:1 range . . . from 73 to 3 times input speed. Manual or automatic remote control instantly and to 38 Rc steel. smoothly adjusts output speed. Variator is rugged,

For full details—photographs, sectional drawings, rating tables, specifications—write today for Bulletin K-200. The compact, quiet running. Cleveland Worm & Gear Company, Speed Variator Division, 3282 East 80th St., Cleveland 4, Ohio.

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Power is transmitted from input shaft to HOW IT WORKS Power is transmitted from input shaft to output shaft through alloy steel driving balls which are in pressure contact with discs attached to the two shafts. Relative speeds of the shafts are adjusted by changing the positioning of the axles on which the balls protate (see cutaway view, right).





(Ehrhardt Tool & Machine photo)

FOR NEXT YEAR: Tool and die makers are already working on some of industry's projects of the future.

Tool and Die Upturn Points To Gradual Business Pickup

Tool and die orders usually precede general business trends by from four to six months.

First to feel the downtrend over a year ago, improved orders make tool and die manufacturers hopeful of a slow but steady upturn.—By R. D. Raddant.

The nation's tool and die manufacturers are optimistic, but they've got their guard up.

From their advance position in learning the forward plans of most industry, large and small, they believe the bottom of the recession has been reached, and a slight upturn in orders now points to a gradual pickup in general business in the next few months.

Consensus Report — Last week in Washington, D. C., at the annual meeting of the trustees of the National Tool & Die Manufacturers Assn., association president Philip R. Marsilius made this conservatively optimistic prediction:

"We feel we are now in a sideways movement with a trend upward," he said. "Our directors report they are optimistic and orders are on the uptrend. There is general optimism and encouragement."

This is particularly apparent among electronics, farm implements, home appliances, business machines and defense industries, including missiles and rockets, he reported.

Defense Gets Moving — Mr. Marsilius, who is also executive vice president, The Producto Machine Co., Bridgeport, Conn., points out that the acceleration in defense spending is just beginning



PHILIP MARSILIUS: Orders are on the uptrend and there is general optimism and encouragement.



WILLIS G. EHRHARDT: Now is a very opportune time to order tools. But you must sell.



DANIEL KARPINSKI: Every auto company has something. When it will develop, we don't know.

to have its effect on the general economy.

"Defense orders placed in the last three to six months are now beginning to show up in tooling orders. Defense business will be increasing as time goes on," he predicts.

Down About 25 Pct—In general, shipments from NMTDA members were down about 25 pct in the first quarter of 1958 compared with the same period of 1957. In the past two months the new orders have leveled out, with even a slight upturn in orders and backlogs over the last quarter of '57.

The outlook is encouraging, he predicts, with key industries now starting to tool up.

Making a general conclusion about the broad tool and die industry is a dangerous proposition. There is no typical shop; there is no typical market.

Situation Varies—The situation is vastly different, for example, for an aircraft-dependent West Coast shop, for a diversified Midwestern manufacturer, or for a New England company like Mr. Marsilius's own plant.

"We work mostly for the aircraft industry," points out Harold G. Murdock, of Arrowsmith Tool & Die Corp., Los Angeles. "We can see no program that will stimulate business there before six to eight months. The major defense plants are completely tooled."

Dim View on Missiles — Mr. Murdock also takes a pessimistic view of the potential in the missile business, because of the small volume and fewer number of parts requiring products of tool and die shops. The best potential in missiles, he believes, is in prototype tooling.

But he is not pessimistic about the overall outlook for his area.

"We're banking on big planes now on the drawing boards," he says. Referring to the North American B-70, still in the development stage but assured of production, "LA will be busy in a year and a half," he says.

Meanwhile, his company is not sitting idly by. It is diversifying, not only widening its base in industry, but going into the forming of special metals such as titanium, working on honeycomb structures, for example. "It's a new field entirely," he says.

Appliances Look Good — Most tool and die makers interviewed by The IRON AGE note tooling plans of the appliance industry as a major factor in the tooling outlook. This

is particularly noted among midwestern tool and die manufacturers who are close to the industry.

A big question is the automotive industry. Tooling for the 1959 models is well under way and work in the automotive tool and die shops for next year's model runs will be completed by mid-year.

"After that, there's nothing in sight," says Daniel Karpinski, Westlof Tool & Die Co., "But we're optimistic that the industry will come up with something. Every auto company has something in the air, but when it will develop, we don't know."

No Small Car Yet—Hottest gossip, particularly among the Detroit group, concerns the possibility of a major program for a small car.

"Rumors, that's all so far," says Mr. Karpinski, "Nothing authentic."

"There is some indication in the machine tool industry of tooling for a small engine," Mr. Marsilius says. "But as far as tooling for a body design, there's nothing yet."

Many of the trustees at the meeting conceded that, as a group, they tended to be better off than the average shop in their area. Many of those interviewed said not all in their area were as optimistic.



JACK KLEINODER: Missile business depends on when they can complete production setups.

Booming in Florida—Situations vary by geography as well as industry served. One of the most optimistic is James F. Jones, whose plant is in Miami Shores, Fla. He has prospered by the influx of electronics and aircraft manufacturers to his state as well as specializing in tooling for aluminum awnings and window sash. He also has done extensive tooling for the Redstone missile.

Electronics Leveling Off—Jack Kleinoder, of Volkert - Stampings. Inc., Queens Village, New York, reports first quarter business off 23 pct from a year ago, but that was the best quarter in history. All in all, this specialist in supplying the electronics industry says business is off about 12 pct from normal.

Time to Tool Up—Tool and die makers believe industry is missing a bet by not taking advantage of the current lull by placing orders for new tooling now.

"Now is a very opportune time to order tools," advises Willis G. Ehrhardt, of St. Louis. "Prices are very fair and with lower backlogs delivery is good. Workers are steady and turning out a good days work. All in all, a buyer is getting tools cheaper and in better quality than in some time."

Accent on Thrift

"Will it cut our production costs and still give us a better product?" Tool engineers and production executives posed this question countless times to more than 500 exhibitors at last week's ASTE Tool Show and Annual Meeting in Philadelphia.

Singed by the recession and facing tougher competition every day, Show visitors didn't hesitate to demand these double benefits. Exhibitors, no less affected by adverse business conditions, did their best to provide a "yes" answer wherever possible.

Show Standouts — In general, show-goers and exhibitors quizzed by The IRON AGE declared the exposition a success. Many booth managers reported sales of equipment for immediate delivery; others were happy with the number of valid inquiries they received for later follow-up.

Mentioned most often as the "hits" of the show were: (1) the several working displays of numerically controlled machine tools; (2) the low prices, slick appearance and apparent quality of the many

foreign-built machines that were shown.

Price Conscious Visitors—Despite the extreme interest that numerical controls had for most visitors, the comment heard most often was that they're still priced a bit too high for small-plant budgets. "Even though it might save us money in the long run, we just can't afford \$20,000 to adapt a drill to run on punched tape," one visitor remarked as he watched a demonstration.

Election Results-Newly elected officers of the ASTE are: president, George A. Goodwin, works manager of the Master Electric Co., Dayton; vice president, Wayne Ewing, Arrowsmith Tool & Die Corp., Los Angeles: vice president, H. Dale Long, Scully Jones Co., Chicago; vice president, William Moreland, The F. E. Myers & Bro. Co., Ashland, O.; vice president, David A. Schrom, York Corp., York Pa.; treasurer, Philip R. Marsilius, The Producto Machine Co., Bridgeport, Conn.: secretary, Charles M. Smillie, C. M. Smillie Co., Ferndale, Mich.



SHOW AND TELL: Visitors at ASTE Show in Philadelphia learn all about adjustable boring heads made by the Briney Mfg. Co., Pontiac, Mich.

Watch for a New Shift in Labor

Recession and public concern have put union leaders on the defensive.

It's a good bet they'll step up politicking to hold gains. — By G. J. McManus.

 Is organized labor shifting its power from the industrial to the political front?

"The top labor leaders are able as well as far-seeing," says Nicholas Unkovic, Pittsburgh lawyer and labor authority. "They will attempt (to translate) their present economic power into an even stronger political force."

Behind the Trend — Nick Unkovic's observations reflect more than 20 years of experience on the Pittsburgh labor scene. A partner in the law firm of Reed, Smith, Shaw & McClay, he has advised steel mills, appliance makers, and department stores in contract negotiations and in sometimes bitter disputes with unions.

"The political action of all unions is becoming more planned, more centralized, and more efficient," says Mr. Unkovic. Behind this activity he sees a situation where labor is seeking to preserve its power through political means because past avenues of growth are closed or narrowed.

Union Roadblocks—Biggest immediate roadblock to significant union gains is the business recession, says Mr. Unkovic. But from a long-term standpoint he calls attention to the growing proportion of non-productive workers as a hindrance to union growth. He says that in 1956 the number of non-productive workers exceeded the production workers for the first time.

"The more non - productive workers we have, the harder it is for the unions to unionize." he says.

Thus, he asserts, unions must concentrate more of their strength on the political front to consolidate what they now have. Straws in the Wind—Mr. Unkovic cites these signs of a stronger political push by unions:

The April 5 AFL-CIO News urged its members to visit congressmen at home over Easter to push union programs for fighting the recession.

The United Auto Workers is seeking to change the General Motors Contract to permit the union to post political notices on plant bulletin boards.

Political action committees of the AFL-CIO are working hard not only in Washington but in state capitals as well.

Recession's Impact—The recession, says Mr. Unkovic, has put unions on the defensive despite the official union party line that big wage increases must be demanded under all economic conditions.

"In private conversations," he says, "most union officials will tell you frankly that no responsible union leader wants to put a company out of business. They will tell you

What Labor Is up Against

The Recession: "Unions will have to go easy on companies seriously affected."

Legal Restraint: "The unions are going to have more federal and state regulation—not less,"

Worker Unrest: "The individual worker has developed the knowledge and courage to seek redress. . . . He is filing charges . . . against his union."

Technical Change: "This may be the peak of union membership.

In 1956 non-production workers exceeded production workers."

Inflation: "Labor is making a mistake in limiting its aims. . . . The people are demanding more enlightened union leadership. . . ."



Nicholas Unkovic
"Labor leaders are far-seeing . . ."

Strategy

further that poor business conditions must be taken into consideration during contract negotiations."

Auto Labor Forecast — In line with this thinking he predicts the auto contracts will be renegotiated without a strike, with no shorter work-week and with only a modest wage increase. In all talks this year, "Unions will have to go easy on companies seriously affected by the downtrend."

Even without a slump he sees unions facing stiffer resistance at the bargaining table. Industry is aroused by inflation, he says; it blames the price spiral on excessive wage grabs by unions. Indicating the current attitude, he quotes Leland Hazard, vice president and general counsel of Pittsburgh Plate Glass Co.:

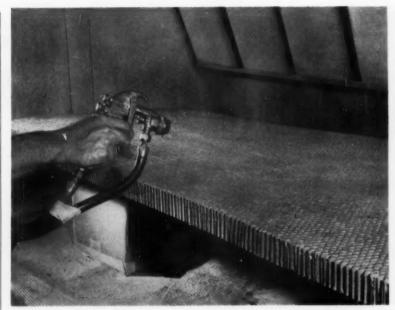
Management Viewpoint—"We in management must begin to refuse wage increases even though we know certainly that our refusals will produce strikes. We have been too timid about strikes. . ."

Rank-and-file union members are beginning to assert themselves, too, says Mr. Unkovic. He claims they are "unusually restless."

Workers Fight Unions—He cites these facts: The number of cases brought before the National Labor Relations Board has doubled in recent months. More than half the cases are being filed by individual workers. There has been a "large rise in the charges filed by individual workers against unions."

More Regulation Due — "The trend is here," he says. "The unions are going to have more federal and state regulation . . . not less."

Finally, Mr. Unkovic feels labor has just about run out of bargaining issues. He suggests that Walter Reuther's profit sharing proposal indicates the bottom of the barrel has been reached.



BIGGER: Growing market for adhesives is assembling curtain walls.

Adhesive Sales Up

• At the start of World War II, sales of structural adhesives for metal bonding and joining were about \$100,000. This year, metal-working companies will use about \$17 million worth.

Jerome L. Been, executive vice president of Rubber & Asbestos Corp., maker of an extensive line of adhesives, predicts sales will approach \$39 million by 1965, based on expansion of current markets, and new ones that look like sure things.

The growth of this up-andcoming industry has been due largely to a growing list of applications where adhesives have been able to compete with other methods of metal joining on performance. For instance:

A leading maker of roller bearings switched from silver solder to an adhesive to eliminate distortion in joining carbides to metal.

Soabar Co., Philadelphia, gets better strength joining alnico magnets to aluminum castings with an adhesive than with the previously used liquid solder.

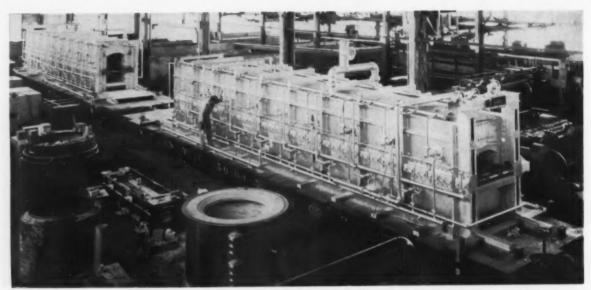
Adhesives have also been carving out a niche in new uses where no other form of metal joining proved practical.

Memco Engineering & Manufacturing Co. uses an adhesive to make a double joint—Mykroy to bronze casting to stainless steel. The company says the "problem could not have been solved with any other joining method."

In some cases adhesives have found their best weapon to be price.

Adhesives are taking over "honeycomb" construction market, mostly for curtain walls, but increasingly for aircraft and missile structures. The cost is only a fraction of brazing costs which run as high as \$300 per sq ft.

More Types — When adhesives for metal bonding were introduced, just before World War II, there were two or three all purpose adhesives for metalworking. Now Rubber and Asbestos alone has 50 or 60 different shelf items.



READY TO GO: 70-ton furnace, largest pre-built unit ever made by Surface Combustion, is set for delivery.

Packaged Equipment Use Grows

If you're in the market for new equipment you'll probably be tempted by a 'package' deal.

It's a trend that is getting more response from industry each year.—By R. O. Schulin.

 At Peoria, Ill., a 70-ft long, 70ton heat treat furnace was unloaded from two flat cars and installed in the Caterpillar tractor plant in less than a week.

At Hoopeston, Ill., a 150-hp automatic boiler was rolled into the boiler room at Food Machinery & Chemical Corp., hooked up and put into operation in less than 48 hours.

These are examples of what is happening in the packaged industrial equipment field—a relatively new manufacturing concept that is steadily gaining popularity.

Its Advantages — The trend is gaining ground for several good reasons. In a buyer's market, packaged equipment offers cost savings, quick installation, the equipment

fits neatly into automated lines, floor space is conserved, and the idea of buying a single unit whose guarantee rests with a single manufacturer has had growing appeal to maintenance-minded users.

Some refer to packaged equipment as pre-engineered, pre-built, standardized, or standard-rated. In use, these types of equipment accomplish the same thing—they simplify the problem of choosing and installing the right equipment for a specific job.

The Pioneers — Companies who had the foresight to step into the packaged equipment business in the past 10 or 20 years find themselves in a fortunate position today.

Orr & Sembower, Inc., a leading boiler manufacturer which entered the packaged field in the mid-30's explains:

"We turned to packaged equipment so we could provide single manufacturer responsibility and complete service to the customer." About 30 pct of the firm's total volume consists of packaged boilers. O&S volume for this kind of equipment has increased 2½ times since 1948.

Saves Design Costs—A large industrial furnace builder, Surface Combustion Corp., says its original reasons for entering the packaged field have been justified.

"We wanted completely controlled production in our own plant and a better end product," the company reports. "We also discovered we were saving money by duplicating existing designs and engineering plans."

Surface Combustion estimates its percentage of packaged units produced today is 30 pct, compared to 70 pct for special units. It expects further increases. "The trend is to standard equipment," the company says, "and packaged units fit right in with the trend."

Conveyor Uses Grow—Rapids-Standard Co., Inc., one of the top three in the packaged conveyor field, began making these units in 1937 when there was a good degree of novelty in the sale of a conveyor to a small company. The firm estimates that 40 pct of its sales volume now is in packaged conveyor units.

"One strong trend in our field is to accomplish an engineered result through the use of standardized and packaged units," the company points out. "The needs of the conveyor user are no longer simple."

Room for More — Mechanical Handling Systems, Inc. began producing packaged conveyors 10 years ago in order to find volume markets other than the large mass-producing industries such as autos and home appliances.

"Increased labor costs continue to force advances in automation on smaller manufacturers . . . and others whose production rates are not great enough to warrant the cost of engineered equipment," states MHS. The company predicts sales of packaged conveyors within the next four years will be almost double the 1954 volume.

Packaged units are also spacesavers. At a Lockheed missile plant, O&S boilers were suspended from the ceiling, releasing valuable floor space for other uses.

Power Transmission Use — Another field where the packaging concept is proving itself, is power transmission equipment. Reliance Electric and Engineering Co. first introduced its packaged V-S drive in 1938. The equipment has made its way into steel mills, machine shops, automotive plants, and other industries where variable speeds and controlled acceleration and deceleration are needed in the production process.

A number of these units can be interconnected to supply motivation force to an entire process line, eliminating the need for a separate generator room.

In the past, consulting engineers who preferred to tailor equipment for each job resisted the packaged equipment trend. But with qualified engineers and specifications men at a premium, management is finding packaged equipment more attractive than ever.

Steel Men Ready For Soviet Tour

 How much progress has Russia made in steelmaking production and technology?

American steel and iron ore mining executives will learn the answer for themselves during a tour of Soviet steel and mining centers beginning May 22 and ending June

American Iron and Steel Institute said the visit was arranged under the agreement on exchanges signed by the United States and the Soviet Union last January. Soviet steel and iron ore technicians will visit this country later in 1958.

Gruelling Pace — The U. S. delegation's itinerary calls for visits to about 10 general and specialty steel mills and some half dozen ore deposits from the Dnieper to Siberia, plus the Central Scientific Research Institute of Ferrous Metallurgy, in Moscow.

No junket, it will cover some 12,000 miles in three weeks, require nightly meetings of all members to collect notes to provide a printed report. The American Iron and Steel Institute is handling arrangements with State Dept. assistance.

Who's Going?—The delegation, headed by Edward L. Ryerson of Inland Steel Co., includes: J. B. Austin, adm. vice president, research and technology, U. S. Steel Corp.; Prof. M. G. Clark, Cornell University; F. S. Eckhardt, asst. general manager, Lackawanna Works, Bethlehem Steel Corp.; M. O. Holowaty, chief research engineer, Indiana Harbor Works, Inland Steel Co.; S. M. Jenks, adm. vice president, U. S. Steel Corp.

Also, E. L. Joppa, general manager, Lake Superior Iron Mining Div., Pickands Mather & Co.; K. C. McKutcheon, consultant, Armco Steel Corp.; N. B. Melcher, chief.

Pyrometallurgical Lab., U. S. Bureau of Mines; G. Mohling, chief metallurgist, research laboratory, Allegheny Ludlum Steel Corp.; F. M. Rich, general manager, Indiana Harbor Works, Inland Steel Co.; E. C. Smith, dir. research and chief metallurgist, Republic Steel Corp.; J. A. Stephens, vice president, U. S. Steel Corp.; J. H. Strassburger, asst. vice president, National Steel Corp.; I. H. Such, Editor-in-Chief, "Steel" magazine; G. F. Sullivan, Editor, The IRON AGE; M. R. Thompson, secretary, foreign relations committee, American Iron and Steel Institute; D. N. Vedensky, director, research & development. The M. A. Hanna Co.; and M. F. Yarotsky, Div. Supt., steel production, South Works, U. S. Steel.

Granite City Expands

Granite City Steel Co. has completed mill rebuilding increasing its cold-rolled steel capacity 30 pct to a yearly total of 750,000 tons. The project, according to Nicholas P. Veeder, Granite City president, is one of the last and most important parts in the firm's \$33 million expansion program.

Units rebuilt were a four-stand tandem cold reduction mill and a temper or skin pass mill.

New Moly Plant

Construction of a \$1 million plant for production of molybdenum and molybdenum-base alloys at Coldwater, Mich. was announced by American Metal Climax, Inc.

The plant is scheduled for production in the third quarter of 1958. It will be owned and operated by Climax Molybdenum Co. of Michigan, a wholly-owned subsidiary of American Metal Climax.

L-P Gas Extends Its Markets

It's Now a \$3 Billion a Year Industry

This year L-P gas will mark up its 27th consecutive year of growth, bucking the general trend of U. S. industry.

Its major goal is to break through in full scale as an overthe-highway fuel.

■ While U. S. industry took a breather in 1957, liquefied petroleum gas sales inched upward by a fighting 5 pct. Last year L-P producers marketed 6.96 billion gallons. In 1958 the industry expects to swing upward to a new high of 7.5 billion gallons, marking up the industry's 27th year of uninterrupted growth.

Conservatively, "bottle gas" has

grown into a \$3 billion industry, and the growth rate for the past half-decade averages 9 pct per year.

Good Metals Market—The L-P gas industry is a still growing user of steel plate, steel sheet, piping and tubing, valve and metering equipment. L-P gas powers refrigerators, trucks, cabs, home ranges, industrial furnaces, tractors, home heating and air conditioning units, grain driers, lift trucks.

President Elisha Gray II, of RCA Whirlpool, said recently: "In the 11 post-war years, the gas industry grew twice as fast as the total gross national product of the nation . . . We can expect that by 1975-L-P gas will have expanded to about 20 billion gallons per year. This is

about a third better than anticipated for the (total) gas industry."

Hot for Engines — Its hottest growth market; as an engine fuel. In 1956, when automotive sales slipped by a disastrous 25 pct from the 1955 peak, L-P carburetor sales slipped by only one-half of one pct. One of the big problems in selling over - the - highway trucks equipped with L-P gas burning engines has been lack of fuel stations. But this is being remedied rapidly.

At present, about half of L-P carburetor output goes into the farm and industrial tractor field, and this strong potential market has only been scratched. And L-P is slipping into the diesel field via a variety of doors.

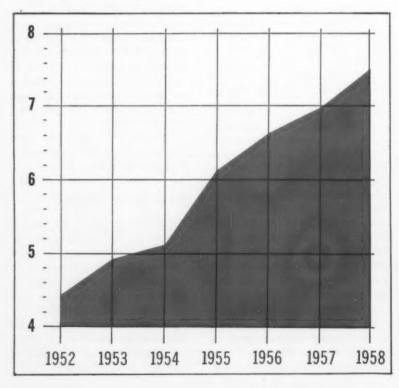
Diesel Field—It is being used on diesel engines equipped to start on diesel fuel, then operate for long periods on a mildly-enriched propane-butane mixture. In this guise, it usually powers stationary engines, such as oil well pumping engines, electrical generators, or engines in fixed plant locations.

Or a 10 to 15 pct propanebutane mixture can be added to the diesel fuel used in over-the-highway diesel powered trucks. The heavy diesel power vaporizes more readily, giving a better power rating. Or propane-butane can be burned as the sole fuel source, as is being done in trucks, on lift trucks and tractors.

Tank Troubles — Tankmakers, however, have not found what could have been expected as a normal demand. In the midst of growth, L-P tank fabrication dropped from 265,-695 tanks in 1956 to 207,252 in 1957. The figure for 1958 will probably run at the 1957 level.

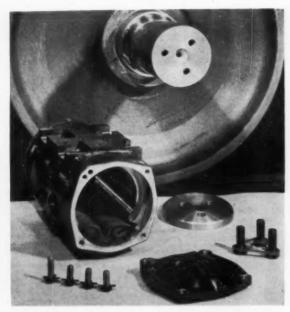
LP Gas Sales Continue to Climb

Sales in Billions of Gallons





INSTALLATION: Cartridge-type bearing made of copper alloy is fitted into place on freight car axle.



BEARING PARTS: This is complete assembly of new American Brake Shoe bearing designed for freight cars.

New Bearing Fills Railroad Need

Cartridge-type units of copper alloy are made especially for freight cars.

They are designed to give longer life with a minimum of maintenance.

 A new copper alloy, cartridgetype bearing for freight cars is impressing railroad industry users.

Its performance record has spurred a replacement trend away from traditional partial bearings and opened up a new market for copper. Developed by American Brake Shoe Co., the cartridge-type bearing was service-tested on the Santa Fe and Great Northern railroads for two years.

Builder Aims—These are some of the advantages its designers aimed for:

Long Life—About 25 years compared with an average of 3.5 years for bearings now used on the nation's 2 million freight cars.

Savings for users. American Brake Shoe bearings cost around \$535 per car sets of eight. Roller bearings now used mainly for passenger cars (less than 2 pet of present freight cars use rollers) range from \$750 to \$900 per car set.

Reducing Hotboxes — Minimum maintenance. Conventional bearings require daily inspections in service, the new cartridge bearings are built to require scant servicing. They are sealed units protected from the waste "grabs" which contribute to hotbox problems.

Less displacement of bearing and axle. The bronze cartridge unit completely circles the axle. Actual bearing surface is electroplated with a lead-tin alloy. This prevents bearing-axle displacement which can occur with partial bearings during coupling of cars. This displacement often permits lubricating wastes to enter bearing and cause costly hotbox failures.

Stronger in Service-Less impact

resistance. Roller bearings can take the impact of passenger cars coupled at speeds of about 1 mph. But freight cars are humped and coupled at speeds up to 10-12 mph. The new sleeve bearings have been built to withstand such impacts.

Temperature Proof—During tests with the new units, cars carrying corrosive ores in desert temperatures up to 130°F had trouble-free operation. Results of trials at temperatures of minus 40°F have been as satisfactory.

Easily Adapted — Bearings fit either the integral-box or pedestal-type side frames—both AAR standards. When installed in the more common integral box, the dust guard must be cut out, a relatively simple operation. A special collar on the axle is the main difference in installation procedure. This requires drilling and tapping three holes in the end of the axle.

Each of the bearings uses from 65 to 75 lb of bronze.

Stalemate on Nicaro Ore Rates

GSA May Lose Ground Trying to Cut Royalties

GSA is trying for a better price for its nickel smelter by slashing price of ore.

But supplier, Freeport Sulphur Co., is standing fast. Delay may cut sale price.—By F. J. Starin.

• The government is going all out to make its Nicaro, Cuba, nickel plant attractive to prospective buyers.

But in its anxiety to boost bids above the giveaway level, General Services Administration may have set back the sale many months. This could be costly.

GSA is locking horns with Freeport Sulphur Co. over royalty rates for Freeport ore, main source for Nicaro. It has reached an impasse. No Pressure — If GSA could promote lower royalties it would make Nicaro more attractive to buyers, and bring a higher price. But there is no particular pressure on Freeport to agree to a cut.

Right now it looks like the nickel market may weaken further, making Nicaro less attractive to buyers. Also, GSA will probably be forced to shorten its sights because it is unlikely to interest buyers with the current agreement.

Contract Problems—Key clause scaring bidders is non-assignability of the contract. Freeport will not be under obligation to supply ore to the new owner.

Also, the government is taking about 2.5 million tons of ore annually. It is legally entitled to

only 1.5 million tons. Freeport has no objection to the government's action, might balk at a private owner.

But Freeport wants some changes also. No royalties are called for on the iron and chrome in the ore.

The contract is cancellable by the government on six months' notice. This, says Freeport, gives the government a chance to "pick the eyes out of the property."

New Proposals—An attorney for Freeport and a four-man GSA team worked out a new contract. It took care of objections on both sides, and lowered Freeport royalties from 8.2 pct of value of nickel contained (actually about 11.57 pct of value of nickel extracted) to 8.5 pct of value of all products extracted.

Freeport accepted, but Franklin G. Floete, General Services Administrator rejected the agreement on the advice of his special assistant, Ira D. Beynon. He said royalties were still too high.

The hassle got a hearing before the House Subcommittee on General Government Activities under the gavel of Rep. Jack Brooks (D., Tex.). Nothing was settled.

Issues—No one seems to agree on how a fair royalty is decided.

Freeport insists such things as scarcity of the ore, quality, degree of development, and lease profit should be considered.

Behre Dolbear & Co., mining consultants retained by Freeport says the royalties are fair based on historical evidence.

For and Against — Chairman Brooks sided with GSA. Harry Wildner, vice president, National Lead Co., now running Nicaro and a likely buyer, says royalties are too high.

Key Issues in New Contract

For 10 years Freeport Sulphur Co. supplied the government nickel plant at Nicaro, Cuba, with ore.

Now the government wants to sell the smelter. Both agree the contract should be changed.

Here's the way the situation on the key issues looks now:

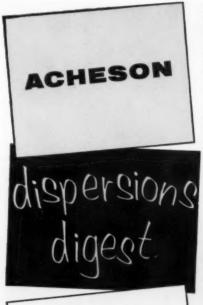
Duration—Both sides agree to extend the period for 10 years. Under the new proposal it will expire on March 11, 1978.

Assignability—The current agreement is not assignable, but Freeport will agree to supply a buyer or leasee of the plant. But the government remains liable.

Purchase—Freeport wants the government to take at least two-thirds of requirements of current capacity (50 million lb). Now, the government must take only one-half of requirements of original capacity (35 million lb), but are actually taking much more.

Source—Freeport will permit the government to take ore from some new properties.

Royalties—Freeport wants to be paid for any iron or chrome that is extracted from its ore. The government has no objection, but there agreement ends. Freeport is willing to cut its rate from 11.57 pct of value of nickel extracted to 8.5 pct of value of all products extracted. The government says this is still too much.



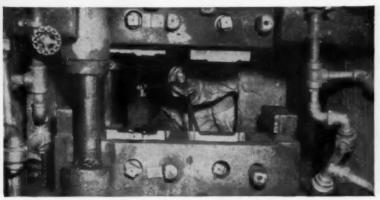
Reporting uses for

COLLOIDAL GRAPHITE, MOLY-SULFIDE, VERMICULITE, AND OTHER SOLIDS

COLLOIDAL GRAPHITE PROVES IDEAL AS FORGING LUBRICANT

Lubricants to be suitable for use on forging dies for steel and nonferrous metals must be stable under the high temperatures and pressures involved. Besides providing the most effective lubrication for hot-work dies, 'dag' brand dispersions act as coolants. Total advantages gained by using Acheson colloidal graphite, as described in the following applications are: improved quality of the forging, reduced die wear, lower production costs, and improved working conditions.

'dag' dispersion improves qual-Ity, cuts costs for Utica Drop Forge and Tool Division. With a large share of their capacity being devoted to the forging of jet engine blades, Utica finds it must maintain high production, consistently high quality, and a competitive price. Blade-forging dies have a comparatively short life due to rapid wear caused by the thinness of the blades, the high pressures required to form the heat-resistant alloys used, and the closer tolerances required. They have found that every one of these requirements can be met by using 'dag' colloidal graphite dispersed in water as their



Operator spraying colloidal graphite on both top and bottom die halves before forging jet engine blades at Utica Drop Forge and Tool Division. Kelsey-Hayes Company.



Concentrated Acheson colloidal graphite being applied to die surfaces before they are put in service.

Pre-treatment and operational use of 'Aquadag' greatly increases die life.

Before putting dies into service, a prominent midwestern manufacturer finds that by preheating them to about 250° F. and brushing on a dispersion of colloidal graphite in water, they have generally doubled the working life of their dies. When used as an operational lubricant, die wear on a truck body brace die was proved by actual measurements to be only one-third the former rate. And this was with 'Aquadag' diluted 1 to 240 in water! . proof of the wide coverage, film toughColloidal graphite is resistant to heat, does not react with the die steel, and the extremely small particle size permits an actual adsorption to the metal surface. A water carrier eliminates the usual smoke and fumes thus affording better working conditions and keeping die temperatures down. After the carrier evaporates, a dry graphite film remains which, besides being an efficient lubricant, protects the die from the accumulation of abrasive dust and scale. Die life is extended from 8 to 14 days and production increased by the reduction in downtime.

Specially compounded, ready-to-use forging lubricants containing 'dag' colloidal graphite are available from industrial lubricant suppliers. If you have a forging lubrication problem, it may pay you to call in your Acheson Service Engineer.

Write for additional information contained in Acheson Bulletin No. 426. Address Dept. 1A-28.

Now, this operation is done in only two blows from original heat. The savings ... \$16,000 a year on this part alone! Add increased life of these precision dies and you can appreciate what a 'dag' colloidal graphite dispersion means to efficient forging. Utica finds water-based dispersions best for press forging, and colloidal graphite in oil the best lubricant for hammers.

forging lubricant. First, it must with-

stand temperatures which range from 1950-2200° F. Sprayed on both halves

of the die it forms a tightly adhering. smooth, microscopically-thin film that aids metal flow and substantially pro-

tects the die itself. In many cases, this has meant fewer finishing operations

and therefore higher production, due to

the improved quality of the blades. A

compressor blade formerly required four

blows from upset to finish, with an in-

termediate heat and tumbling operation.



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ness, lubricity, and basic economy of a Offices In: Boston • Chicago • Cleveland • Dayton • Detroit • Los Angeles • Milwaukee "dag' brand dispersion. New York • Philadelphia • Pittsburgh • Rochester • St. Louis • Toronto



Engineered by Tinnerman...

Train maker cuts assembly costs 37% with one-piece Tinnerman SPEED CLIPS®

On Lionel electric trains, one-piece Tinnerman Speed Clips fasten car trucks to car bodies... cut assembly costs 37%. Each Speed Clip replaces a grooved screw-machine part and a special retainer ring. Also eliminated are riveting and crimping operations.

Specially engineered for Lionel, this Speed Clip is easily snapped through punched holes. Spring steel fingers compress, then spring apart to complete the truck-to-body attachment.

Perhaps your product can be assembled faster, better, at lower cost by a switch to Tinnerman Speed Nut brand fasteners. Your Tinnerman sales engineer can make on-the-spot fastening recommendations. Or he can arrange

for a complete no-obligation Tinnerman Fastening Analysis of your product. He's listed in the Yellow Pages under "Fasteners." Or write to:

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CANABA: Dominion Fastemers Ltd., Ramilton, Ostario. CEEAT BRITAIN: Simmonds Agreeosserius Ltd., Treferest, Wales. FRANCE: Simmonds S.A., 3 rus Salomon do Rethrichid, Suresses (Salon). CERMANY: Macasa-Bundy Cmbill, Heidelberg.

Armco Plans Texas Facilities

 Armco Steel Corp. is considering a new seamless mill for Houston, Tex., and LD oxygen converters for Ashland, Ky.

No timetable has been set for the mill, which would be added to the Houston works of Armco's Sheffield Div. The oxygen converters have been fully engineered but are still waiting a go-ahead.

In explaining the reasons for a Houston pipe mill, company president R. L. Gray pointed out that it would complement the seamless capacity of Armco's recently acquired subsidiary, National Supply Co. He said Texas is a logical site because it is in the center of the six-state area that takes 75 pct of domestic oil country seamless.

One Million Tons — He said Armco is in a position to build a Texas mill at a reasonable cost because it already has a steelmaking base in the area. New capacity can be added at the Houston works for about half the cost of a grass roots project of the same tonnage, he estimates. He talked in terms of 1 million tons to be added. Present Houston capacity is 1.5 million tons.

Mr. Gray indicated that a direct

reduction plant was a strong possibility for Houston. He said Armco was keeping close track of direct reduction. . "We think it's going to be a big development." He said the new site would probably be supplied with Labrador ore. At present, Houston gets ore from East Texas and Mexico.

Discussing Armco's overall operations, Mr. Gray said the company was leaning in the direction of LD oxygen converters for its Ashland works. He feels the process has proven itself.

New Bar Mill

Ceco Steel Products Corp. will erect an \$11 million bar steel mill at Lemont, Ill.

The Chicago fabricating company, one of the largest suppliers of structural and related steel products for the construction industry, will produce steel in the new plant under the name of Lemont Manufacturing Corp., a new subsidiary.

Company president Ned A Ochiltree said the entire output of the bar mill, which will have a capacity of 120,000 net tons of billet-sized ingots per year, will be used by Ceco.

Screw Machine Products Forecast

Can screw machine products average 10 pct higher for the remainder of 1958?

Industry spokesman Orrin B. Werntz is holding to his earlier prediction that the industry will hit midway between unit volumes marketed in 1949 and the levels of 1954. At the close of first quarter this year, screw machine products were roughly 20 pct below the first quarter 1957 figure.

To fulfill Mr. Werntz' forecast,

the industry must average at least 10 pct above present levels over the next eight months.

Some Show Gain—The industry is holding the sales gains scored in early first quarter over the December low. Adding point to Mr.

Werntz' optimism, a handful of producers have even broken through the March ceiling.

Any new business comes from electronics, missiles, appliances, office equipment, farm equipment, and truck manufacturers.

West Coast Brass Mill Gets Ready



GRAND OPENING: Equipment at American Brass Co.'s new mill at Paramount, Calif., is being readied to officially begin production early in July. The \$50 million plant will be one of the most complete on the West Coast. It will have a capacity of about 30 million lb annually.



Include Price in the Many Advantages Solid Brass Has Over

Other Materials Many concerns are discovering that the availability of solid brass—at competitive prices—makes it extremely advantageous to use in place of other materials.

For example, parts of the desk lamp shown here made by J. Schrader Co., Cleveland, Ohio, are now being made of Bridgeport F-37 Ultra Fine Grain Brass Strip. Formerly, these same parts were made from a plated product. Now, with solid brass as an active cost competitor, its inherent qualities of workability, beauty and durability over other metals and methods are employed with excellent results.

This is an opportunity that warrants your attention. Your Bridgeport salesman will be glad to show you how solid brass can benefit your product. You'll find that he will work with you in every way. Look into the benefits of solid brass... including its cost.



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Boyd S. Oberlink

Boosting the U.S. Road Program

Importance of the Federal highway program to the economy is stressed by Mr. Oberlink.

He recommends applying good old business sense to the project before it bogs down.

■ The construction machinery industry is ready and able to provide the equipment needed to start the giant Federal roadbuilding program rolling, reports Boyd S. Oberlink. But we must turn to Congress for the money to keep the program moving ahead on schedule, he adds.

Mr. Oberlink, group vice president and a director, Allis-Chalmers Mfg. Co., is a spokesman for the men who build the bulldozers, shovels, graders, and other equipment that go into building roads.

Public Response—"It is my belief that our Federal program for the interstate highway system has unprecedented appeal to and support of the American people," he states. "The public expects all of us to find the ways and means by which this program will be completed."

As a businessmen, Mr. Oberlink realizes that financing the program is a matter of principal concern. Increasing costs, he points out, continue to aggravate the problem. And the longer the delay, the worse it will get.

Examining the Cost—"As a manufacturer, it has been my experience that the lowest unit costs are obtained when we are able to plan a program well in advance, schedule it for early production, provide materials and labor in a smooth-flowing pattern, and then proceed to produce according to plan.



BOYD S. OBERLINK: Delays and interruptions are costly.

"When for any reason we are forced to interrupt the continuity of such plans, we find our costs fluctuate badly . . ." he comments.

Progress Report — He observes that the planning, scheduling, and availability of materials and labor for the highway program are in good shape. It only remains for the program to proceed on schedule.

"Obie" Oberlink started with Allis - Chalmers Tractor Div. in 1934, after he was graduated from the University of Illinois with a degree in mechanical engineering. He rose steadily through the executive ranks, was named to his present job in January, 1956.

On the way, he won the respect and confidence of the entire industry. Last January he was elected president of the Construction Industry Manufacturers Assn., composed of 238 companies. CIMA serves as the Manufacturers Div. of the American Road Builders Assn.

Dealing with the Federal government is no new experience to Mr. Oberlink. Allis - Chalmers loaned him to the government for a time in 1952-53 to serve as director of the Agricultural, Construction, and Mining Equipment Div. of the National Production Authority.

There is probably no industry representative better qualified to help push the highway program.



OPTIMUM RESULTS STEEL DIVISION

restricted specification cold rolled strip steel

Oftentimes, sound selection of cold rolled strip steel should involve more than making a choice of one or more readily available, standard specifications. To achieve best fabricating results, or to improve manufacturing performance and end-product superiority, may require the employment of strip steel specially designed for your particular use. J&L Restricted Specification Strip Steel is that kind of product. As an example look at this . . .

TYPICAL APPLICATION ...

product



specification

Low Carbon Deep Drawing Steel Size-3" x .010 Analysis-AISI-1010 Temper-Deep drawing, non-scalloping Finish—#2 Tolerance ± .0002 including crown Width Tolerance ± .002

Coil Size-250# per inch width min.

results

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The experience, facilities and accumulated know-how of a specialized organization devoted exclusively to strip steel processing are available to work with you. In this clearing house of strip steel engineering and application information, it's a good bet there is something of value for you. Your inquiry will get our immediate, interested attention.



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Hesitant Buyer Needs Convincing

Industry's major job is to convince consumers that so-called easily deferred purchases should not be deferred.

Action is needed on taxes, prices, and wages to clear the air for the consumer.

 As unemployment grows and consumer confidence wanes, the business world's principal problem grows with compound interest.

The problem is to convince an increasingly doubtful public that there is an advantage in buying now. Particularly in the easily deferred consumer durables area, the problem is to put an end to the tendency to postpone.

Adverse Forces — Other than conventional promotional devices, little has been done to convince a buyer that he has something to gain by buying now.

Instead, a number of forces, some beyond the control of business, are building up to convince the public that now is a time not to buy.

One is the probability of an excise tax cut. There is strong evidence that this is having a significant deterring effect. Vague promises that it would be retroactive are of little avail. "I can wait," is the consumer reaction.

Another is price. Business has tried to get over the message that prices of most major products just can not come down. But with half of Congress calling for price cuts, and all of labor, the public is skeptical. It can afford to wait and see.

Action Needed—What's needed is some prompt, and courageous, action to get some of these things settled that are now hanging over the economy's head.

Congress will have to get moving and get its anti-recession program, particularly its tax bill, into action.

Strong industry action on prices is needed. If firm stands are needed, now is the time to take them, at the risk of unpopularity.

Labor is trying to save face, particularly in the auto negotiations. But facing up to the facts and getting a realistic settlement can help the economy, and will be greeted by the members a lot more cheerfully than might be expected.

Clear the Air—The important thing is to clear the air, and let the buying public know where it stands, not to confuse it by a lot of propaganda and shouting.

Finally, a new approach is needed. "You Auto Buy Now" and other similar campaigns are having some local effect. But industry, particularly the consumer durable makers, will have to go to its market and convince it that there is something to be gained by buying this year.

Otherwise, these "easily deferrable" purchases will be deferred even

Inventory Cutbacks Continue

Keeping an eye on the critical inventory picture, manufacturing inventories dropped about \$400 million in March to a total of \$52.4 billion.

This is about the same rate as the two preceeding months, but the total reduction for a year is only about \$1.3 billion for manufacturing. This underlines the phenomenon that although manufacturers instituted strenuous inventory control measures last summer, actual effects were not felt on total inventories until early this year.

Durables Lead—The bulk of the cutback in all manufacturing inventories is in the hard hit durable goods sector.

Another key factor is a significant reduction at the retail level of automotive inventories, dropping \$120 million in March on a seasonally adjusted basis. It still leaves a substantial inventory of \$4,670,000,000 in unsold autos, quite a cleanup problem at even today's reduced production rates, although

the breakdown between new and used isn't known.

While figures for April are still in the tabulation stage, the trend in April probably followed March.

Is Seasonal Upturn Coming?

It's not even an indication yet, but there is some slight evidence of a seasonal buying upturn developing.

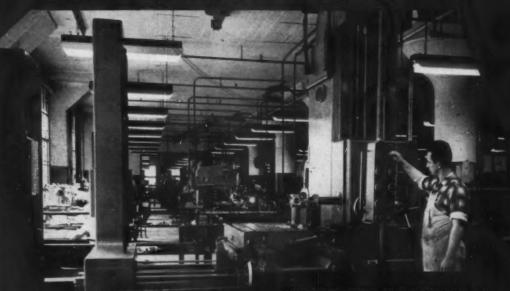
Dun & Bradstreet's latest trade review reported that consumer buying for last week equalled or edged slightly above last year.

Cars Too — Most cheerful to metalworking was stepped - up spending for appliances, particularly air conditioners, laundry equipment, and hi-fi sets.

It was reported that spot checks indicated new car sales were boosted considerably over the week before by special sales promotions (see above) with another upturn in the used car market.

PROFIT DEVELOPMENT ... is important!

"We discovered," reports the Mergenthaler Linotype Co., "that a Bullard H.B.M., Model 75 saves us valuable time. It eliminates much of the waiting and handling time previously used in the fabrication of jigs, fixtures and special parts."



"With our versatile and accurate Bullard H.B.M., Model 75, we can mill, drill, bore, tap, ream and inspect a piece without removing it from the table. Now we perform as many operations as possible on the same machine."



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How modern Bullard Machine Cools can improve your profits

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Labor Sounds Off on Automation

Machine Operators Find Their Work a Lot Easier

Many workers who had misgivings when automatic equipment appeared on the horizon, have changed their minds.

The hard core of dissenters is smaller than expected, this study shows.—By H. R. Neal.

• What do workers think of automation? To find the answer, Michigan State University's Labor and Industrial Relations Center sent Prof. W. A. Faunce into one of the most highly automated engine plants in Detroit.

Some 125 workers were interviewed at random. All were experienced in both automated and non-automated production lines. They averaged nearly 20 years seniority. Surprisingly, 72 pct indicated they preferred their present automated jobs to their old jobs using conventional machines.

Less Exertion—Of the reasons given, Mr. Faunce said, 68 pct referred to the fact the automated job involved less material handling and less labor. Few other reasons were given.

Some types of automated jobs were considered more interesting by the workers because of the greater complexity of the transfer machinery. They felt the new jobs were "more challenging," and commented there was a lot to know and learn about the operation of the machines.

"Ins" Feel Secure — Acquiring new "operating skills" also gave the workers a feeling of greater personal job security. However, looking down the long transfer lines and the wide spaces between operators causes workers to view automation as a threat to the jobs of their non-automated fellow workers.

Mr. Faunce points out the workers are seldom actually responsible for learning a great deal about the machines. They are only responsible for operating the equipment and making tool changes.

The Objections — Most of the reasons listed for preferring nonautomated jobs were stated in negative terms — disliked features of automated jobs. Most frequently mentioned, yet only 17 pct of the total, was the production quota system employed for non-automated processes. Because of the independence of the various machines, the worker could work ahead and take a break if he desired.

Others preferred non-automated jobs because of the difficulty in identifying what the transfer machine does as "his" work. Opera-

What Workers Like And Don't Like About Automation

A study made in a Detroit automobile plant by Michigan State University reveals mixed feelings in the ranks of labor regarding jobs on automated lines. Seventy-two per cent of the workers interviewed said they preferred their new machines to conventional equipment. Here is what they like and don't like about automated machines:

The Good Points

Involves less material handling, less labor.

Complicated machines make the job more interesting.

New operating skills acquired offer more job security.

The Bad Points

Can't work ahead and take a break.

Difficult to identify oneself with the work.

Machining skills are no longer needed.

No control over work pace.

Mistakes are costly, breakdowns frequent.

Constant alertness is required.

Less contact with fellow workers.

More foremen and supervisors around.



□ET ^ FreeDemonstration

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Ask us to prove how a 'Budgit' Holst can cut YOUR lifting costs Pick up your phone. Call the nearby 'Budgit' Electric Hoist distributor to send a man out with a hoist. (If he isn't listed under 'Budgit' in the hoist section of the yellow pages, write us.) Tell him you've picked a spot to hang the hoist and plug it in. In the few minutes the demonstration takes, you will know how easy, fast and safe lifting can be.

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Mere pennies pay for all the electricity the 'Budgit' uses a day. It's fast — lifts ¼-ton at 34FPM. One-hand control frees the other hand to guide the load. Each of the two entirely separate automatic brakes alone can hold the load safely. "Quick as a wink" braking saves time in "spotting" loads in machines and for assembly.

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Automotive Production

WEEK ENDING	CARS	TRUCKS
May 10, 1958	77,128	17,150
May 3, 1958	78,441	17,817
May 11, 1957	125,924	23,198
May 4, 1957	119,999	23,849
TO DATE 1958	1,664,200	327,000
TO DATE 1957	2,536,300	421,300
*Preliminary	Source: Ward	s Reports

tors no longer have any control over the machine and the work pace. Also, machining skills previously acquired are no longer needed.

Machine Is Boss—Some typical reactions to questions which reflect this feeling:

"(I don't like) the lack of feeling responsible for your work. The feeling that you're turning out more work but knowing it's not yours really and not as good as you could make it if you had control of the machine like before."

Another worker said, "It's a completely different feel of work. On my old job, I controlled the machine. On my present job, the machine controls me."

Tension Increase — In some cases, dissatisfaction comes from increased feelings of tension or anxiety. "This," Mr. Faunce said, "results from increased speed of production, constant attention required, cost of mistakes and frequency of breakdowns of automated equipment." He believes tension must be regarded as an important source of dissatisfaction on automated jobs.

One worker was understandably concerned about the effects of tension: "(Automation is) just different all the way through. You've got to be aware all the time and push the right button. If you push the wrong one it could cost around \$13,000 and is very dangerous. I pushed a wrong button and stuff flew all over. I was lucky, but it cost the company \$13,000 to fix the machine."

Bull Sessions Missed—Automation also brings important changes in the "social" life of workers changes which are a surprisingly large source of job dissatisfaction.

In old plants, work stations are close enough together to permit "social interaction" (conversation) at least once or twice an hour. Workers told Prof. Faunce the job didn't require as close and constant attention. It was possible to work ahead of the production schedule, turn off the machine, and take a break — which further facilitated social interaction.

That Lonesome Feeling — Less than half of the workers said they were able to talk "very often" to the men around them. This compares to 80 pct saying they could on the old job. There were also "significantly" fewer people involved in group contacts—less than four persons to a group in the automated plant compared with five to six previously.

From this, Mr. Faunce concludes many workers on automated production lines "are virtually isolated socially because of the distance between work stations, the necessity of close attention to the job, and the noise of the machines."

After Hours Report—Fewer on the job contacts have also reduced the number of off the job contacts among workers. Almost 2.5 times as many workers, the study showed, reported they used to get together socially off the job more often with friends from their old job than they do at present.

Frequency of job contact apparently plays an important part in determining job satisfaction. Of those satisfied with their present job, over 50 pct reported frequent social interaction on both jobs.

Too Many Foremen?—Automation has also produced some changes in relations between workers and supervision. Workers interviewed agreed there are more foremen and supervisors in the automated plant, and more frequent contact with them. The added supervision is not entirely welcome.

One worker said: "They used to be friendly. Now they seem to be under a strain."

THE BULL OF THE WOODS



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CINCINNATI FILMATIC No. 1 Centerless Grinding Machine, with Crush Truing Attachment and Electro-Hydraulic Automatic Infeed Attachment. Catalog No. G-703.

Everyone concerned with quality and costs will be delighted with the performance of new CINCINNATI FILMATIC No. 1 Centerless Grinding Machines. They are built for precision infeed and thrufeed work, and can be equipped with a variety of production attachments, including crush truing. Highlights of design and how they contribute to top performance include:

Exclusive FILMATIC grinding wheel spindle bearings...
over 99% of these bearings on all CINCINNATI Grinding
Machines have never required service

Swivel mounted regulating wheel unit . . , reduces setup time

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In addition, Cincinnati has a selection of 19 attachments, such as graduated axial spindle adjustment, Electro-Hydraulic automatic infeed, grinding wheel spindle reciprocation, crush truing, and others, \P Your centerless grinding equipment for work within $1\frac{1}{2}$ " diameter range can now be profitably replaced with new CINCINNATI No. 1's. Our Engineering Service Specialists, the world's most experienced in tooling up centerless grinders, are ready to help. Get a good start by asking for catalog No. G-703.

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Crush Trued Wheels



Crush truing unit, with cover removed. Crushing rolls are cartridge mounted for setup convenience. Motor mounted on the bracket drives the rolls for regrinding them, while an auxiliary motor supplies the slow speed required for effective wheel crushing. Diamond wheel truing unit is mounted on top of wheel guard.





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Seaton Plan Faces Rough Going

Too Much Criticism for Metals Subsidy Plan

Most points of the plan to support prices of copper, lead, zinc, tungsten and fluorspar are opposed by powerful forces.

It may mean defeat for Ike's move to head off demand for higher tariffs.—By G. H. Baker.

The Eisenhower Administration, attempting to head off recession-fed moves for higher tariffs and quotas with a subsidy plan for aiding metal and mineral mining industries, is facing a long, uphill fight. It may well fail.

Critics of the so-called Seaton plan for government payments to insure the prices of minerals and metals, haven't yet opposed the plan in principle. But, singly and as a group, they have criticized every major feature of the proposal offered by Interior Secretary Fred A. Seaton.

Like Brannan Plan—The Seaton program has already been dubbed a "Brannan plan for inedibles," referring to a program once advocated by former Agriculture Secretary Charles F. Brannan which called for the government to make up the difference to farmers between actual crop prices and a so-called base price.

The Seaton program would, in effect, do the same thing for five metals—copper, lead, zinc, tungsten, and fluorspar.

No Margin—The mining industries have called the Seaton program inadequate. Their position is probably best summed up by Charles E. Schwab, chairman of the Emergency Lead-Zinc Committee, before Congress recently. The support base

prices Seaton proposes would provide no better than a break-even basis for most mines, and would not provide the margin required for adequate exploration and development programs, nor for plowing back profits for needed capital expenditures for rehabilitation or proper maintenance of plant and equipment, he said.

Import Controls Demanded—The only answer, the mining industries say, is "reasonable control over imports." Some form of government subsidy would be helpful, but it is not the answer, the producers contend.

The mining industries aren't the

only ones unhappy with the Seaton plan. Metal using industries as well are complaining.

Changes Inevitable—Revisions in the original Seaton plan appear inevitable. The Interior Dept. has already indicated it will offer some amendments to the original proposal itself. One will probably be designed to meet complaints of metal consumers that "safeguards" are needed.

This change would set floor prices for the metals involved, below which the government would not support them, to prevent potentially disastrous price cutting by U. S. producers.

Pentagon Stifles Engineering Progress

No Communication—The Pentagon's excessive zeal for secrecy is stifling engineering advances.

Because of over-strict and fussy military regulations dealing with military secrecy, the nation's best scientific and technical experts are forbidden to compare notes or to communicate with each other—even when they are working on similar projects.

Leadership Lost—One congressman, Rep. John Moss, who heads a House subcommittee investigating the growth of censorship within the Eisenhower Administration, says the nation's loss of the first lap in the race into space is a direct result of the government's censorship policies.

In order to regain our scientific lead, the military leaders and others who suppress information have got to stop trying to hide discoveries of the basic laws of nature, Mr. Moss points out.

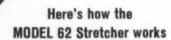
Needlessly Confidential—In addition, the executive branch of the government must start removing secrecy labels from the hundreds of thousands of reports and documents which already have been needlessly classified as secret or confidential. This will open the doors of information to engineers and technical people trying to learn answers to many problems already answered but whose answers are tightly locked away in government files.

There is no attempt here on the part of anyone to expose information that would help an enemy of the U. S. The problem at hand is only to strip away the veil of secrecy needlessly imposed upon facts not related to defense or facts which are already known.

Absolute Tension Control

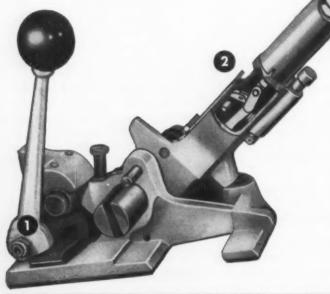
insures fast, economical strapping

The USS* Gerrard Model 62 Stretcher gives absolute tension control in your strapping operations. There's no need for cautious tensioning "by feel." With guesswork eliminated, you can strap any kind of package quickly and confidently. And because the job gets done faster, it means less labor, fewer man-hours, more production. This adds up to real economy.



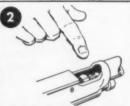
The setting and controlling device is built into the handle. You simply set the gage indicator to the tension you want, and a loud click signals when that degree of tension is reached. The result is that each strap bears an equal share of the load, insuring maximum security for the package. The stretcher can be used with $\frac{3}{4}$ " x .028, $\frac{3}{4}$ " x .035 and $1\frac{1}{4}$ " x .035 USS Gerrard* Flat Steel Strapping.

The Model 62 Stretcher, with its ability to maintain absolutely uniform tension, is ideally suited for any packaging application, no matter what size or shape. For information on this and the many other versatile steel strapping tools made by USS Gerrard, contact a USS Gerrard Sales Representative. He has the answer to all your packaging-tying problems.





Integrally built-in scrap cut-off shear for speed of application, package appearance and greater safety.

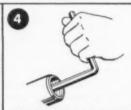


Loud click signals operator when he reaches the predetermined tension.



Precision - calibrated indicator enables operator to select the proper tension.

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Adjust for desired tension by simply inserting wrench in the handle.

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U. S. Steel Supply
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Gerrard	Blue	Book	of	Pa	ckaging.			

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How to Get Missile Subcontracts

Spend Time Selling Contractors and Air Force

Market is wide open for subcontractors, says Gen. Funk, missiles buying boss of the Air Materiel Command.

Substantial quantities of ground support equipment are required.—By R. R. Kay.

There's a lot of talk on the West Coast that small firms haven't a chance to get missile business. Don't believe it, says Major Gen. Ben I. Funk. And he ought to know. He's the nation's ballistic missiles buying boss for the Air Materiel Command, Inglewood, Calif.

Sound Your Horn—"If you can produce the hardware we so urgently need, we will help you in every possible way to get on the team. It is up to you to make your capabilities known, and sell them to the major prime contractors and to the Air Force. I urge you to do this now, to the advantage of your company," Gen. Funk says.

Naturally the majority of small business firms can't produce air-frames, engines, and major components which make up the ballistic missile weapon system. However, the subcontract market is wide open. The sky is the limit, the general insists.

Half in the West—Fifty pct of the 200 ballistic missile weapon system's first tier subcontractors are in southern California. And they have over \$100 million in contracts. Second, third, and fourth tier firms are getting a good share, too.

Here's a rundown on what small companies are now doing for the AMC's missile program: They're machining and plating. They're making valves, gears, shafts, ducts, tanks, castings and forgings, electronic and electrical components, and tooling. And a lot of other equipment that goes to make ballistic missiles operational.

Forty Per Cent for Ground— That's not all. Remember that 80 pct of the maintenance support of missiles will go for ground support equipment.

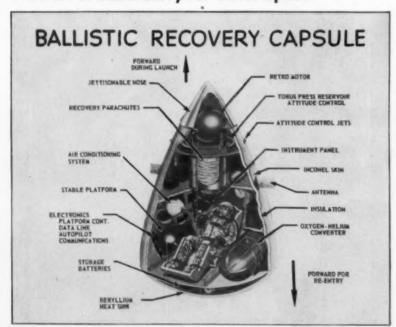
For example, ten Atlas missiles at a launching site will represent less than 20 pct of the total cost. Another 10 pct will be in spare parts and 30 pct in technical facilities. A solid 40 pct of the mis-

sile dollar will go into ground support equipment.

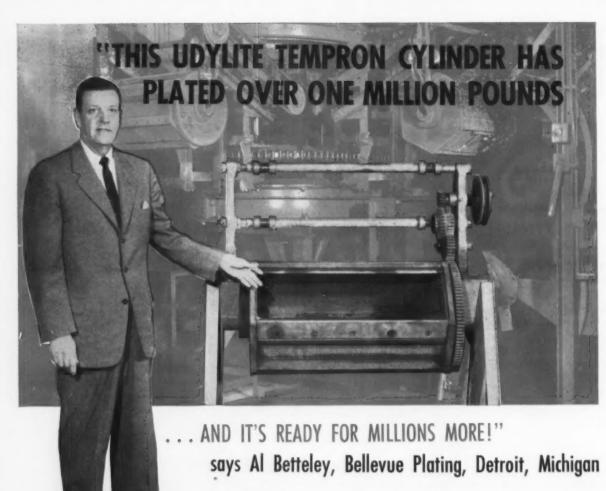
Rocketdyne Div. of North American Aviation makes rocket engines for both the Atlas and Thor. Last year the company paid out \$40 million or almost 18 pct to small business firms who are among their first tier subcontractors. Also, more than \$13 million went to second, third, and fourth tier small companies from large first tier subcontractors.

Rocketdyne now has over 4000 small business concerns on its sub-contractor list. Of these, 80 pct are in Los Angeles County, close by the prime contractor.

Preview of Laboratory for Outer Space



TEST CENTER: Man's reaction to outer space may be tested in satellite vehicle designed by Northrop Aircraft, Inc. Rockets would slow vessel for gradual descent into earth's atmosphere in order to recover man.



"We have discovered," continues Mr. Betteley, "that because of their rugged construction and amazing heat and abrasion qualities, these plating cylinders are the most economical and desirable we have ever used. We process up to 200 pounds of work in 14" x 30" cylinders at temperatures up to 212°F. with no damage or softening. Then, contrasting this, we immediately rinse them in cold water. Their ability to withstand these terrific temperature variances allows for greater production and the unique design makes maintenance a very simple task. In short, we're satisfied with Udylite Tempron cylinders. They give us more for our money!"

Like so many other platers, Bellevue Plating has discovered the advantages Udylite Tempron construction has to offer. If you desire full production with a minimum of maintenance, you'd better make the discovery, too. Your local Udylite representative has the full story of how they can benefit you and your plating operation. Call him today, or write direct to:



Belt Grinders Are "Rediscovered"

New Models Are Limited Only By User's Ingenuity

Makers of abrasive belt grinders say their potential is almost unlimited.

They are backing up their optimism with eye-opening performances.—By E. J. Egan, Jr.

■ The abrasive belt grinder has been something of a "sleeper" in the machine tool field. Most production men concerned with metal removal problems still don't think of this equipment in the same sense as the more familiar metal cutting machines—or even grinders using abrasive wheels.

But the word is getting around, that abrasive belt grinders are turning in some eye-opening performances. To a man, the makers of these machines believe their potential is almost without limit.

With Modern Machines — Some of the jobs being done with streamlined abrasive belt machines were described at the recent Westinghouse Machine Tool Forum. The speaker was John A. Simmons, product manager of The Engelberg-Huller Co., Inc., Syracuse, N. Y.

He cited one machine, which performs six different grinding and finishing operations on typewriter tab and margin racks. The unit has four abrasive belt grinding heads mounted in vertical and horizontal sequences, with two wire brush heads at the end of the line.

Parts are through-fed at rates from 5 to 30 fpm. An air-operated stacker unloads them automatically. The grinder gets credit for saving 8000 man hours per year.

One-Machine Line—Another, a multiple-head machine for grinding and finishing screwdriver blades, is "practically a production line in itself," says Mr. Simmons. Its central feature is a merry-go-round type of fixture.

Every 90 seconds the machine does 7 operations on 20 blades. It's all automatic, including blade ejection at the end of the cycle. Each of the machine's seven heads is adjustable to take various sizes of blades, and extra sets of chucks make the chain-driven fixture equally adaptable. This unit reportedly boosted production 50 pct.

Close Tolerances — Simmons emphasized "the abrasive belt grinder of today is a precision machine tool." His examples:

A four-head model removes 0.005 in. of stock from chain saw bars made of tool steel, at 10 product feet per minute. It holds a tolerance of 0.001 in.

An automatic machine in an atomic fuel production line sizes the OD of uranium dioxide slugs to a total indicator reading of ± 0.0005 in.

Limit is Ingenuity—"In one respect," Simmons said, "the application range of belt grinding is limited only by the ingenuity and imagination which can be brought to the design of fixtures, whether by the manufacturer or the user."

"Key" Holes—But Not For Keys



MUST BE ACCURATE: Careful drilling of precision-spaced hole patterns in tubesheets for feedwater heaters is an important job being done at Alco Products, Inc., plant at Dunkirk, N. Y.

INDUSTRIAL BRIEFS

Bethlehem for Safety — Thirtynine operations of the subsidiary companies of Bethlehem Steel Corp. received National Safety Council awards for outstanding performance in safety during 1957. Of the 39 operations receiving recognition for their 1957 records, 27 were repeats from 1956.

Countermeasures—Sperry Gyroscope Co. has awarded subcontracts to eight other companies totaling about \$14 million under the U. S. Air Force's electronic countermeasures (ECM) program for B-52 intercontinental bombers. Sperry's countermeasures division is prime contractor for the "electronic package" for the B-52 which will not only jam enemy radars, but "deceive" missiles.

Under Pressure — The Missouri Boiler & Sheet Iron Works has changed its name to the Missouri Boiler & Tank Co. The company now fabricates steel and alloy plate pressure vessels and other plate products. It formerly produced only sheet metal non-pressure vessels and culverts.



"Fred, meet Miss 'Safety First.' "

Can't Stop Now—A U. S. Navy contract totaling \$5.6 million has been awarded to Westinghouse Electric's Corp.'s aviation gas turbine division in Kansas City, Mo. It is for continued development of the company's J34 jet engine.

Business in Vacuum — Standard Steel Works, Burnham, Pa., Div. of Baldwin-Lima-Hamilton Corp., has placed a contract with the Vacuum Equipment Div. of F. J. Stokes Corp., Philadelphia, for the design and construction of a new vacuum stream degassing system. The system will have two chambers, each capable of receiving a 15-ton pour into an ingot mold.

Good Advice—Richard Morse, president, National Research Corp., Cambridge, Mass., has been appointed chairman of the Army Scientific Advisory Panel. The panel is comprised of leading scientists, engineers, educators and industrialists who advise the Secretary of the Army on all aspects of research and development.

A Bow for Bowes—A 1957 "National Recognition Award" of the Chamber of Commerce of the U. S. was presented to Pitney-Bowes, Inc., Stamford, Conn. The award, for a "significant contribution to community betterment and to strengthening free enterprise," was presented to Frederick Bowes, Jr., vice president of the company.

First Decontamination License— Tracerlab Inc., Waltham, Mass. has been issued the first license granted by the U. S. Atomic Energy Commission for combined decontamination and storage operations. Tracerlab may, under the provisions of the license, perform decontamination operations in all of the 48 states and D. C.

Down on the Delta — Westinghouse Electric Corp. plans to build a product distribution center in New Orleans, La. The center will consolidate Westinghouse sales offices in the New Orleans area which handle X-ray equipment, air handling and air cleaning equipment, elevators, and packaged air conditioners. It will serve as a warehouse and headquarters for Westinghouse appliance sales.

Ready for Testing—A test laboratory has been placed in service by Hamilton Div. of Baldwin-Lima-Hamilton Corp. at its Hamilton, O., plant. Purpose is for research and development work in the field of parts compacting. Tests will encompass the compacting of such materials as metal powders, abrasives, carbides, cements, ferrites, plastics, nuclear fuels and solid fuels for rockets and missiles.

Smoother Service — Solar Steel Corp. is offering integrated warehouse services to the Detroit industry. Solar has enlarged and modernized its River Rouge plant to combine the activities formerly conducted by its bar and tube plant with the present River Rouge operations.

Alcoa Buys Back — Aluminum Co. of America, will purchase self-generated turnings and borings from users of Alcoa aluminum screw machine stock. Under its new policy, Alcoa will buy scrap in amounts not to exceed 60 pct of the customer's purchases from Alcoa, its distributors, or jobbers. Offer is restricted to screw machine stock in alloys 2011, 2017, and 6061.

AEC Business—A contract for a 600KW Selenium Rectifier, heavy duty type, DC power supply, has been awarded to Perkin Engineering Corp., El Segundo, Calif., by the Atomic Energy Commission. This contract is in addition to a 100KW unit presently being manufactured by Perkin for the AEC.

Up in Minnesota—Westinghouse Electric Supply Co. plans to build a new warehouse-office building to serve the Duluth, Minn., area. It will be located at 330 S. First Ave., and will serve as a sales office and warehouse for WESCO, and as a sales office for Westinghouse Electric Corp.'s apparatus sales division.

with A.I.S.I. Identification and Type Classification of Tool Steels Columbia Tool Steels for 1958

3 > N - 3 -Identifying Elements, in Per Cent Si Type C | Mn

HIGH SPEED TOOL STEELS

MOLYBDENUM BASE - TYPE SYMBOL M

	15	
	SMOOTHCUT	
ы	E SM	E 3
MOLITE	MOLITE	MOLITE

M1	.80	1	1	4.00	1	1.00	1.50	8.00	1	
Mg	.80	1	1	4.00	1	2.00	9.00	5.00	1	
M2	.80	1	1	4.00	1	2.00	90.9	5.00	1	
M3	1.00	•	1	4.00	1	2.70	9.00	5.00	1	
M4	1.30	1	1	4.00	1	4.00	5.50	4.50	**	
M6	08.	1	1	4.00	-	1.50	4.00	5.00	12.00	1
M7	1.00	1	1	4.00	1	2.00	1.75	8.75	1	1
Me	08.	1	ı	4.00	Name of the last	1.50	5.00	5.00	1	1.25
M10	.85	1	1	4.00	1	2.00	1	8.00	1	1
M15	1.50	1	1	4.00	1	5.00	6.50	3.50	5.00	1
M30	.80	1	1	4.00	1	1.25	2.00	8.00	5.00	1
M34	06:	1	1	4.00	1	2.00	2.00	8.00	8.00	1
M35	.80	1	1	4.00	1	2.00	9.00	5.00	5.00	1
M36	.80	1	1	4.00	1	2.00	6.00	5.00	8.00	1

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D. F. Roby, named chairman of the board, American Metal Products Co., Detroit; A. M. Mras, named president; R. J. Williams, executive vice president; F. C. Matthaei, Jr., vice president, research and development; A. C. Janis, treasurer; J. H. Larson, secretary.

D. H. Boyd, appointed president, U. S. Steel Homes Div., U. S. Steel Corp.; H. D. Moulton, appointed asst. vice president—international.

L. G. Backart, elected president, Rapistan-Keystone Co., Inc., Detroit.

Gordon Galloway, elected vice president, The Austin Co. of Canada Ltd.



W. J. McCune, appointed vice president, commercial, Sharon Steel Corp., Sharon, Pa.

H. B. Chambers, appointed vice president, metallurgy, Atlas Steels Ltd., Welland, Ontario.

T. F. Bell, elected vice president. Interlake Iron Corp., Cleveland.

T. R. Adams, elected vice president, Eastern operations, Detroit Steel Corp., Detroit.

P. O. Geier, Jr., elected vice president and director, and W. K. Mathias, elected vice president, Cincinnati Milling & Grinding Machines, Inc., sales subsidiary of The Cincinnati Milling Machine Co.

T. L. Denney, appointed general sales manager, The Garlock Packing Co., Palmyra, N. Y.



N. P. Veeder, elected chief executive officer and chairman of the board, Granite City Steel Co., Granite City, Ill.

R. P. Bergan, appointed vice president, consumer products, National Carbon Co., Div. of Union Carbide Corp.

M. A. Tardiff, appointed manager, general equipment sales, Hanson-Van Winkle-Munning Co., Matawan, N. J.

H. E. Sullivan, promoted to controller, Warren Div., The American Welding & Mfg. Co.



J. H. Harris, named vice president, Weirton Steel Co., Div. of National Steel Corp.

J. K. McLaughlin, appointed general sales manager, Magnethermic Corp., Youngstown, O.; P. A. Hassell, appointed asst. general sales manager.



A. R. Zender, elected president, Bridgeport Brass Co., Bridgeport, Conn.

W. R. Mundy, promoted to manager, stainless steel products, Jones & Laughlin Steel Corp.'s Warehouse Div., Indianapolis, Ind.



J. E. Potter, elected vice president and treasurer, Tinnerman Products, Inc., Cleveland.

F. Richardz, appointed consulting specialist, gearing products, Gearing Div., Westinghouse Electric Corp., Pittsburgh; R. L. Mathias,



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appointed division engineering manager; R. H. Timmons, appointed manufacturing manager, Gearing Div.



C. A. Jones, elected secretary, Tinnerman Products, Inc., Cleveland.

E. S. Fitzgerald, promoted to sales engineer, Cleveland district office, and John Szuhay, promoted to sales engineer, Pittsburgh area, Steel & Tube Div., The Timken Roller Bearing Co., Canton, O.



E. W. Dany, appointed executive vice president, Patterson Foundry & Machine Co., E. Liverpool, O., a Ferro Corp. subsidiary.

- L. T. DeLaup, promoted to asst. to the president, Southwest Steel Products, an Armco subsidiary with headquarters in Houston, Tex.
- F. S. Senior, appointed manager, development section, Engineering and Construction Div., Koppers Co., Inc., Pittsburgh.

- E. D. Hanagan, named controller, Oakite Products, Inc., New York.
- J. H. Kellogg, Jr., appointed manager, Special Products Div., The Electric Products Co., Cleveland.
- **D. R. Scott,** appointed manager, planning, Robertshaw-Fulton Controls Co.



J. L. Neudoerfer, elected chairman of the board, Wheeling Steel Corp., Wheeling, W. Va.

R. C. Friedly and H. A. Hallstein, Jr., appointed product sales managers, Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.



W. A. Steele, elected president, Wheeling Steel Corp., Wheeling, W. Va.

J. B. Gibson, promoted to asst. manager, tubular products, Tubular Products Div., Jones & Laughlin Steel Corp.; W. F. Ewart, promoted

What every good metal man should know about CARBONITRIDING

First of all, it is a good idea to know what equipment will do the best carbonitriding job for your specific requirement. And the best way to find this out is to talk over your problems with the people who have consistently developed the methods and equipment for better, more dependable, more economical carbonitriding results. That would be Lindberg.

Let's look at the record. Lindberg's contributions to carbonitriding and carburizing go far beyond just the building of furnaces to do it. It covers the development of controlled atmosphere generators, the creation of dew point equilibrium curves to establish



proper atmosphere values for type of steel and temperatures involved and the exclusive Lindberg Carbotrol to maintain these values automatically in production.



Typical installation of Lindberg Hyen Almosphere Generator, Lindberg Carbotrol

and Lindberg Carbonitriding Furnace.

Then there is the invention of the "dimple" vertical radiant tube which gave new efficiency and economy to fuel-fired atmosphere furnaces. Lindberg's exclusive CORRTHERM electric heating element made practical the use

of electricity in atmosphere furnaces.

Add to this our record over the years of building a broad variety of carbonitriding and carburizing furnaces, big ones, small ones, manuals, automatics, fuel-fired, electric, and it seems it's just good common sense to bring your heat



treating problems to us. Just get in touch with the Lindberg Field Representative in your locality or write:

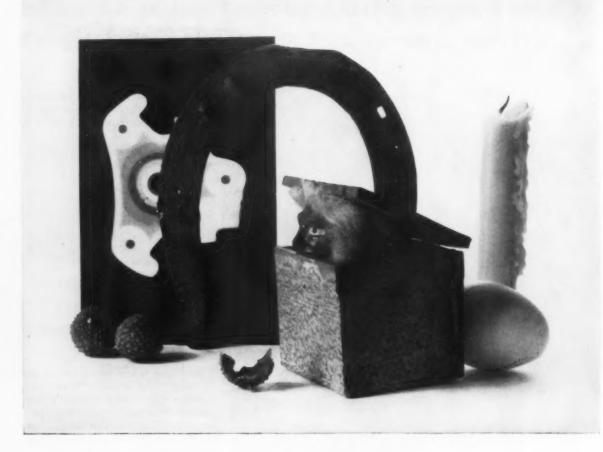
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2452 West Hubbard St., Chicago 12, Illinois

Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.







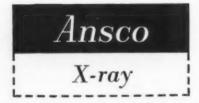
How to candle a horseshoe!

If castings were like eggs a simple candle would solve all inspection problems.

Getting inside things to "have a look around" is unfortunately a somewhat more critical process.

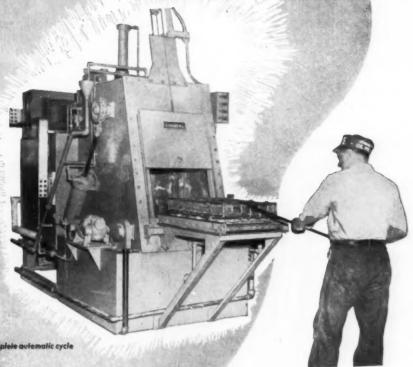
And since life itself often depends upon the delicate layer of silver that reveals flaws, only an X-ray film having superb gradation and tonal separation can be depended on in routine as well as specialized work.

And tonal separations are the very characteristic that makes Ansco X-ray films special. That's because only Ansco X-ray films are critically coated to tolerances that provide unequalled quality and uniformity. Ansco X-ray films . . . for candling horseshoes!



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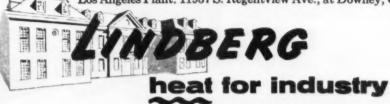


This furnace has complete automatic cycle and quench control.

> This is the most widely-used carbonitriding furnace of all. Day in and day out production of tons and tons of work has proved this furnace's ability to increase production quality and volume and reduce costs. It is a versatile furnace, too, not only for carbonitriding but for other uses, carburizing, annealing, carbon restoration and many hardening applications.

This type of furnace is available for both manual and automatic operation. It can be equipped either with Lindberg's efficient new vertical radiant tubes for fuel-firing or for electric heating with Lindberg's revolutionary new CORRTHERM element.

Versatile as this furnace is, we don't claim it is the best solution to every carbonitriding problem. But, whatever your need may be, talk it over with Lindberg. Our engineers, as they have done in so many instances, will recommend a sound answer-design it, build it, even field-install it if you wish. Just get in touch with the Lindberg plant or the Lindberg Field Representative in your locality. Lindberg Engineering Company, 2452 West Hubbard St., Chicago 12, Illinois. Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.



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This new HELIARC HW-18 Hand Welding Torch weighs only 7 ounces, making it easy for you to handle, less tiring. The special one-piece water cooling channel eliminates sources of leakage. And it's made for rugged, heavy-YOU GET BETTER SHIELDING WITH LESS GAS Improved design of collet body and closer electrode fit assure uniform argon flow, without jetting or turbulence. GIVES YOU RUGGED SERVICE Torch body is Fiberglas-reinforced phenolic for greater resistance to heat and thermal shock. Handle is tough, polished plastic. Gas cups have 4 times the impact strength of ordinary cups. LEAKPROOF Molded, one-piece water cooling passage has no joints to permit leakage no water drip to contaminate welds. Diagram shows leak proof, one-piece water EASY, MORE ECONOMICAL cooling passage in MAINTENANCE LINDE'S NEW HELIARC Collets, collet bodies, cups and caps are HW-18 Hand Welding interchangeable with those of your HW-17 Series 2 Torch. All couplings have standard IAA connections, and adap-See and try this new HELIARC HW-18 Torch! For a tors are included. Your production costs are lowered, too, for the new HW-18 demonstration, mail coupon today. Or call your dissaves time in hard-to-reach spots. Torch tributor or nearest LINDE office. LINDE COMPANY, is designed for continuous 300-amp Division of Union Carbide Corporation, 30 East 42nd service, a-c or d-c. Street, New York 17, N. Y. Offices in other principal cities. In Canada: Linde Company, Division of Union Carbide Canada Limited. Dept. I-53, Linde Company, Division of UCC 30 East 42nd Street, New York 17, N. Y. ARGON SHUT-OFF VALVE (Optional) saves time, steps and argon. Please advise me where and when I can examine and try out the new HELIARC HW-18 Hand Welding Torch. NAME UNION COMPANY ELECTRIC WELDING LOOK TO STREET CARBIDE CITY_ ZONE STATE

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to administrative assistant, tubular products.



J. G. Hutchinson, elected vice president and comptroller, Wheeling Steel Corp., Wheeling, W. Va.

R. L. McSwine, appointed sales representative, Atlantic district, Metallurgical Products Dept., General Electric Co., Detroit.

Alexander Dreisin, appointed chief engineer, Fuel Injection Dept., Harvey, Ill., Works, Allis-Chalmers Mfg. Co., Milwaukee.



R. F. Gladfelter, elected president, Detroit Power Screwdriver Co., subsidiary of Link-Belt Co.

OBITUARIES

D. W. Leavitt, founder and president, Cap Screw & Nut Co. of America Inc. and the Remington Screw & Bolt Mfg. Co.

Hamilton Garnsey, Jr., 56, vice president and general manager, Goulds Pumps, Inc., Seneca Falls, N. Y.

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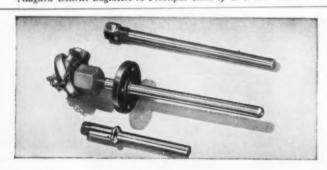
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Thermo Electric Co. Inc.

In Canada — THERMO ELECTRIC (Canada) Ltd., Brampton, Ont.

New Materials Handling Ideas from Republic

SPECIAL STEEL PALLETS HELP JOHN DEERE CUT ENGINE LOADING TIME 80%, UNLOADING TIME 86%



PRECISION MADE, REPUBLIC STEEL "BOLT DOWN" PALLETS have helped solve a tough, expensive, interplant shipping and handling problem at John Deere, because they were engineered to the requirements of the job.

Four combine engines are bolted on to each pallet at Deere's Dubuque, Iowa, tractor plant, then trucked to the Harvester Works at East Moline, Illinois. There, the engine-loaded pallets are picked up by fork trucks and moved quickly and easily to the production line or to temporary storage.

Use of Republic Steel Pallets eliminates the need for truck dunnage for shoring up each individual engine. This feature alone results in a time saving of 80% in loading operations and 86% in unloading.

The pallets, designed and made by materials

handling specialists at Republic's Berger Division, measure 43" wide and 64" long. Each pallet is equipped with 16 threaded holes for bolting down the engines. Spacing of these holes is such a critical part of the pallet design that they must meet a tolerance requirement of ½2 of an inch.

Tough, strong steel and corrugated construction combine to take the heavy engine loads in stride. Steel pallets were selected for this application by Deere, because they would require minimum maintenance and would be usable over many years.

Why not talk over your handling or storage problem with a Republic Engineer. A specially designed or standard pallet, box or skid could help you save time, cut costs, simplify an operation. Contact your Republic Materials Handling Representative. Or mail the coupon. There is no obligation.



NEW IDEA FROM REPUBLIC for making special purpose tables, stands, catwalks, racks, scaffolds. It's BILD-A-FLEX, Republic Berger Division's slotted construction angle. Use it as "metal lumber". Simply plan your assembly, cut BILD-A-FLEX, join with bolts. Horizontal and vertical slots make adjustment easy. Bonderized and finished with gray baked enamel after fabrication. Shipped in convenient bundles of 10 angles, 10- or 12-foot lengths. Stores in same space as one 2" x 4" piece of lumber. Write for new idealoaded cataloa.





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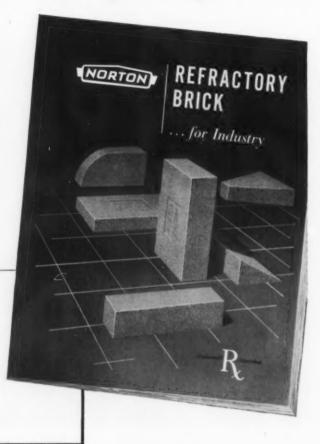
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What to Do About Porosity In Aluminum Castings

By John Obrebski-Chief Metallurgist, Monarch Machine Tool Co., Sidney, O.

The usual form of porosity isn't visible and so doesn't create a problem in the bulk of aluminum castings uses.

But small voids loom large in terms of strength, wear-resistance or ability to contain hydraulic pressure. Here's how to prevent them.

• Faced with porosity in certain aluminum castings for machine tools, Monarch made a detailed study of aluminum casting methods and their influence on porosity. The object: to formulate a set of rules for the company's casting suppliers and guarantee castings of proper density.

In some cast aluminum parts, such as covers, brackets and hand wheels, porosity isn't very serious. There are certain other applications, however, in which porosity is critical —mainly, hydraulic system castings, cast sheaves and similar parts subject to pressure, stresses and wear.

Harmful in Many Ways—Internal voids reduce the working section of the casting and lower the alloy's mechanical properties. Larger voids can easily cause leakage in hydraulic castings. Such castings must be specially impregnated, which raises production costs. Surfaces subject to wear don't work well if they are porous; first because the working surface is reduced, and secondly because pores absorb and retain abrasive dust.

Porous castings cannot be plated

properly, since metals like zinc, chromium, and copper can't form a continuous deposit to cover pores. If anodizing is to be used, the pores will absorb the anodizing liquid (mostly sulfuric acid). No amount of washing or rinsing will drive this solution completely out of pores. Anodized castings (porous ones) often bloom after only a few days or weeks, because of inside pore corrosion.

Despite these possible problems, there are a number of good reasons for using aluminum. The main advantage is its weight; added to this is the fact that it won't rust or corrode in contact with hydraulic oils—a vital point in high performance hydraulic systems.

What Makes It Porous?—Fig. 1

represents an ideal aluminum solidification process. First, the liquid alloy cools down in a mold (a). Then solidification centers appear (b). They grow into dendrites or globulites (c). Dendrites and globulites grow still further (d) into crystals (e). Some of the liquid alloy remains between the crystals; it eventually solidifies, and at the end of the solidification process, there are solid crystals only (f).

Since every single crystal having a theoretical volume, let us say, of one cubic inch actually consumes more than one cubic inch of liquid alloy, shrinkage results. Tiny voids, or micro-shrinkage, may appear between dendrites. These are called between-dendrites, or interdendritic micro-shrinkage. Eventually, micro-

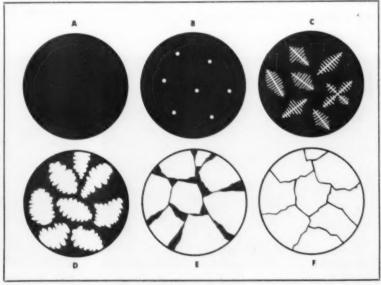


FIG. 1: Solidification starts with the formation of extremely small crystals which in effect become the solidification centers as the metal cools.

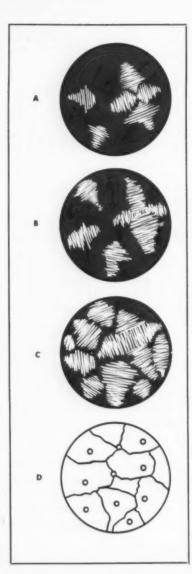


FIG. 2: Globulites and dendrites expel gases as they grow, but gas bubbles are eventually trapped by the crystals and remain as pores.

voids may separate crystals; there are termed between-crystals, microshrinkage, or intercrystaline microshrinkage.

The higher the solidification rate, the smaller the dendrites and globulites and the smaller are the crystals. The smaller the crystals, the smaller are the various types of micro-voids. It is a common axiom that fine grained castings are usually close grained ones.

Because liquid metal shrinks, it's important that all sections of the casting be properly supplied with it until solidification is completed. If they aren't, larger voids and spongy areas may be found.

Influence of Gases—Solubility of gases in liquid metal is quite high, depending mostly on chemical composition of the alloy and its temperature. Every over-heating of the liquid alloy will result in its saturation with gases. In the case of aluminum alloys, hydrogen normally is blamed for all evils. Actually, any gases dissolved in the liquid alloy will result in gas porosity during solidification.

Fig. 2 shows what happens. The

small crystals which become solidification centers have an amazing ability: they can expel gases from themselves, and so are practically gas free. When crystallization centers are growing into globulites or dendrites (a), this self-degassing continues and the dendrites and globulites also become gas free.

But the surrounding liquid absorbs gases expelled by dendrites and globulites. Eventually, this remaining liquid becomes over-saturated, and the continuing supply of gas forms bubbles (b). While the bubbles try to escape from the liquid, they're usually trapped between dendrites and globulites (c) and end up in the casting as gas pores (d). Since the solidification process is quite complicated, it isn't unusual for the gas to form larger shrinks as well.

Voids are Invisible—Machining of aluminum castings, and especially grinding, polishing, and buffing, makes minor porosity invisible. Pores, micro-shrinkage and even spongy areas are filled with tiny chips and dust. As a result, these voids must be very large to show up visually.

In order to locate any voids, a thin layer of alloy must be removed or etched off by chemical means. The popular notion that etching causes porosity is absolutely untrue.

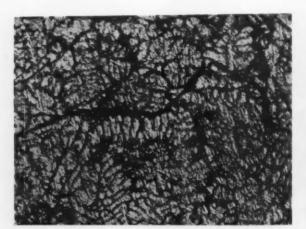


FIG. 3: Light gray areas are dendrites and globulites, while the long black lines between them are the intercrystalline voids. 25x.

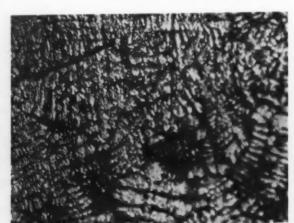


FIG. 4: Large black dots in lower portion of micro are the trouble spots—between-dendrites voids that constitute porosity. 25x.

Standard foundry practice for aluminum castings isn't always the answer where prevention of gas porosity is concerned. Even vacuum melting and vacuum degassing aren't completely effective; the perfectly degassed alloy often picks up gases from the surrounding atmosphere as soon as it's poured or transferred from the ladle to the molds.

Quick handling of the gas-free alloy is very important. For best results, the degassed metal should be protected from the surrouding atmosphere by fluxes. Otherwise it'll have to be vacuum poured as well as vacuum melted or vacuum degassed. Such methods require costly and complicated equipment.

Slow Cooling Does It—Crystallization is in itself a degassing process, but gas bubbles are trapped during solidification by fast-growing dendrites and globulites. If favorable conditions for self-evecuation of gases from the over-saturated liquid alloy could be created, the gas bubbles would be removed.

Experiments at Monarch confirmed this fact. First, very porous castings were sawed into pieces. Next, the pieces were melted in a small graphite crucible in a laboratory box furnace. Then the crucible and liquid alloy were cooled slowly, along with the furnace. When it had solidified, the small ingot was

removed from the crucible and sawed into two pieces. And finally, a section of it was deeply etched.

Although a few small shrinks were revealed close to the top of the ingot, there was no gas porosity in the test specimen at all. The gas bubbles apparently were able to find their way out through the liquid metal, due to the very slow solidification of the alloy.

Effect of Flux-Both pieces of the small ingot were put back into the crucible and, in the same box furnace, preheated to 1450°F. The alloy melted quickly. Some Alcoa Brazing Flux #3 was added, and the liquid alloy became covered with liquid flux. Immediately after the alloy melted it was poured into a warm graphite crucible (used as a mold). Deep etching showed the casting was perfectly dense. Similar experiments were repeated many times. Different alloys were used. Yet the results were consistentperfect density.

In further trials, pieces of a very porous casting were melted in the small graphite crucible with flux added. When the level of the liquid metal was about an inch from the top of the crucible, more pieces of cold metal were added. Due to absorbtion of heat, the liquid alloy froze.

The crucible was immediately

heated and the alloy melted. This time the liquid level was only about ½ in. below the top of the crucible. More pieces of cold metal were added until the liquid again solidified. The crucible was quickly heated again.

As soon as the alloy melted (as well as the flux on top of it), it was slightly overheated and quickly poured into another warm crucible. The solidified ingot was examined as before. From a density standpoint, it was practically ideal.

Adding High Si-This method may be used for alloys containing silicon as the alloying element. Pieces of very porous castings were melted and flux added. The liquid alloy was slightly overheated and the crucible removed from the box furnace. Alcoa brazing wire (about 10 pct Si) 1/4 in. in diam was quickly immersed in the middle of the crucible and forced to the bottom of the liquid. It melted almost immediately. Then, the alloy was poured into another crucible and the solidified ingot was examined. There was no gas porosity.

The following conclusion could be drawn: Melting of pure aluminum first (with flux protection) and then adding copper-rich, siliconrich, or magnesium-rich pre-alloys can aid in obtaining quick-solidifi-

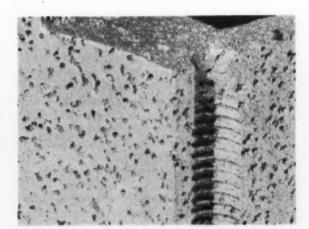


FIG. 5: Overall porosity in aluminum castings isn't usually visible to the naked eye. In this severe case magnification is 2.5x.

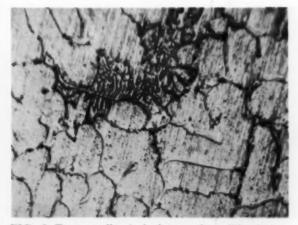


FIG. 6: Two metallurgical phases—the solid solution and the eutectic—are visible in this aluminum casting micro taken at 150x.

cation degassing. Pre-alloys, however, must be properly selected to regulate the amount added and to bring the liquid pure aluminum close to solidification temperature.

Russian Theory—A very small Russian book, "Thermodynamics in Metallurgy," concludes that "deoxidation is possible only when chemical reaction results in the increase in the entropy of the universe." The author, a physicochemist, calculated mathematically the deoxidation of aluminum and its alloys by the very powerful deoxidizer phosphorus. He proved that such a deoxidation is impossible.

Chlorine gas, as well as asbestos balls soaked with titanium-chloride, could, he said, be used as deoxidizers for aluminum (but only if the alloy doesn't contain sodium as the modifier). Chlorine combines chemically with the oxygen. Such a chemical compound is volatile, and is not soluble in aluminum. As to the deoxidizing power of manganese or other metals, no definite statements are offered.

Nitrogen is widely used as a degasser. It is supposed to remove hydrogen from aluminum alloys. To explain this reaction, $2N + 6H = 2 \text{ NH}_3$. This, however, appears unlikely, because ammonia can hardly exist at high temperature. Actually, nitrogen probably attacks the aluminum oxides, forming aluminum nitrides and freeing the oxygen.

Two Possibilities—The nascent oxygen may combine vigorously with hydrogen present in the liquid bath. Some foundrymen feel that nitrogen gas provides a surface on which the absorbed hydrogen can cling, and thus be carried out of the metal bath. Also, the partial pressure of hydrogen in the nitrogen bubble is very much less than the partial pressure of hydrogen in the molten aluminum. To try to equalize this condition, the hydrogen will diffuse into the nitrogen bubbles and thus be carried to the surface.

At Monarch we have examined many nitrogen-treated alloys. Not all of these castings were free of gas porosity. For those that showed overall gas porosity, we concluded the degassing process didn't work.

Chlorine gas also is credited with degassing properties. It is supposed to combine with hydrogen to form hydrochloric acid. If this is true, chlorinated alloys should make porosity-free castings. But very often, this isn't the case.

Fluxes dissolve the skin (aluminum oxides) floating on top of the liquid metal. This action, in itself, isn't very important, since the alloy may be skimmed. But flux does protect the surface of the liquid alloy from surrounding gases and keeps the alloy gas-free after degassing has been completed. Degassing, combined with fluxing, can do a very good job.

Looking for Trouble — Macro etching or deep etching are effective ways to locate micro and macro voids. Figs. 3 and 4 show how the faults appeared in a small experimental ingot. The alloy was degassed by slow solidification.

A piece cut from a casting with overall gas porosity is shown in Fig. 5. Micro-examination shows how many metallographic phases are present and what they look like, as in Fig. 6.

An experienced eye may be able to see internal voids and pores of every kind on the fracture. Binocular microscopes should be used. Magnifications of 5x up to 20x are recommended.

Very often mechanical properties of castings are evaluated on separately cast test bars. Since small test bars solidify quickly, and since thicker sections of the full size casting will solidify much more slowly, mechanical properties determined on test bars may be higher than those of the actual casting itself. In other words the test bar may be dense, the regular casting porous. Thus, the only way to be certain that a particular production run isn't porous would be to actually section one of the castings.

Nine Ways to Improve Density

If castings must be perfect, specify only virgin metals.

To avoid overheating, alloy melting operations need careful control. Specify fast melting, precise temperature-regulating equipment.

If low cost isn't vital, specify vacuum melting.

Vacuum degassing is desirable, but only if the foundry is equipped to handle it properly.

Nitrogen degassing can be used for non-critical work, but specify exact duration and temperature of treatment.

When using scrap and/or oven returns as secondary alloys, slow-solidification degassing gives good results.

If heavier sections are to be chilled, make certain risers are properly located.

For proper inspection, cut an actual casting into pieces and etch to determine density.

Don't depend on additives or chlorination to deoxidize aluminum castings.

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New Tube-Drawing Ideas Boost Mill Capacity

A new drawing process and mechanized handling switched Wolverine Tube's obsolescent Detroit mill to one of the most efficient.

Savings—in floor space, less scrap, use of manpower—border on the phenomenal. And mill capacity is up 50 pct.

By R. H. Eshelman— Engineering Editor

• New thinking about the essentials of nonferrous tube making has spurred one producer to turn an obsolete mill into a really advanced unit. Space limitations at first had the firm, Wolverine Tube Div., Calumet & Hecla, Inc., thinking of closing its Detroit mill.

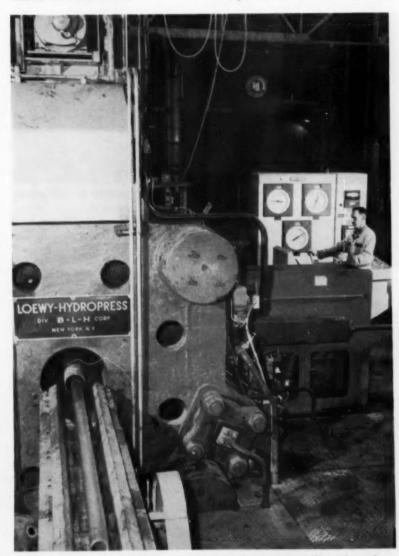
But a second look at the situation, coupled with studies of foreign methods, sparked some new concepts that may alter tube making radically. While none of the basic ideas are startlingly new, the mixture is. And it promises some huge savings. For example, floor space needs have been cut 40,000 sq ft, yet production capacity is up 50 pct. Direct labor will gradually be reduced 35 pct, also, and additional cost savings are assured in inspection, packing and shipping.

Further, the improved process eliminates a quarter of the scrap, since there are fewer points swaged on tubing for workholding and fewer "tails" left often drawn tubes are cut to length. Early runs indicate that rejects and damaged tubing will drop as much as 35 pct.

Even more important, in-process inventory is being halved. This greatly reduces the materials investment. At the same time, greater flexibility in tooling and handling makes it possible to schedule an order to completion in a single shift instead of four to six days.

Use Coil Drawing — One basic concept made this plant rejuvenation possible: a complete switch from conventional in-line draw benches to coil drawing. For this the plant uses a piece of equipment known as a bull block.

This unit, similar to some that Wolverine engineers saw in England, is a combination draw bench and coiler. Rough tubes, swaged at one end, are fed through a die and clamped on a large coiler. The coiler, some 5 feet in diam, rotates at 2000 fpm, pulling the tube through the die and around the



FAST SQUEEZE: Extrusion press forces hot copper billets through a circular die to form rough blanks.



SPACE SAVER: Bull block table in background rotates to pull coiled tubing off the reel and through the draw die, then recoils it.



TRIPLE PLAY: Tube reducer takes three rough blanks at once, does the work of five cold drawn passes in one step.

drum. A floating mandrel in the tube prevents collapse of the walls and smooths the ID during the severe draw.

Speeds Handling — These tube coils simplify handling between processes. Hooks on overhead conveyors pick up coils from an automatic loader. The overhead system also provides compact, in-process storage, and is a major factor in keeping scrap down.

The main conveyor system is the power-and-gravity type which automatically maintains a stock of tubing at each operation. It gets rid of most of the drudgery and errors associated with crane loading and unloading and in-process handling of long lengths. By using previously wasted "air space," it also frees valuable floor area for other uses.

Starts with Extrusion—The first tube making operation in the revamped plant is to extrude sized billets. Three induction heating stations bring them to temperature and supply a steady flow to the extrusion press. The press operator controls both billet feed and the entire extrusion process with pushbuttons. This is faster and yields a longer tube blank of better quality than the former method.

The old process pierced the hot billet by ramming it against a bullet-shaped mandrel. This produced only 10 feet of rough tubing against the 24-ft extruded blanks.

First Draw Unique—To link the extrusion operation with bull block finish drawing, plant engineers wanted a compact process to replace the space consuming draw bench. But it had to be suited to continuous production. A small setup they saw in Sweden seemed to fit the bill. Back in the U. S., they worked with Aetna-Standard Engineering Co. to develop a large machine suited to their own needs. It's the only one of its kind in this country.

This speedy first-draw unit handles three extrusion tube blanks at one time. Essentially it's a rolling mill, reducing the wall thickness 90 pct in a single pass. This is

equivalent to five cold draw passes and the production of two triple drawbenches of 100,000 and 150,000 lb capacity. Rolling eliminates pointing of the tube blanks, also sawing and crane handling. Tubes go directly to a bull block for reduction without annealing.

How It Works — Three tube blanks 31/8 in. in diam feed into guides and are started over mandrels into a pinch roll unit. Tubes then feed forward into clamping position. The severe reducing operation requires a coolant-lubricant.

A saddle assembly holds the rolling dies and is driven by a crank and connecting rod. This drive pushes the dies forward along the tubes, reducing the OD and rolling the ID onto a tapered mandrel. Each time the saddle moves forward an indexing mechanism turns the tubes and feeds them forward a pre-determined distance. Workholding chucks grip the tubes on the reducing stroke, then release them while feed chucks continue turning and advancing the tubes on the saddle's return stroke.

In-Line Feed—From this initial reducing operation, tubing, now 1½ in. in diam, feeds forward on a roller gravity conveyor to a break-down bull block. The 200-ft long conveyor holds the maximum processed length.

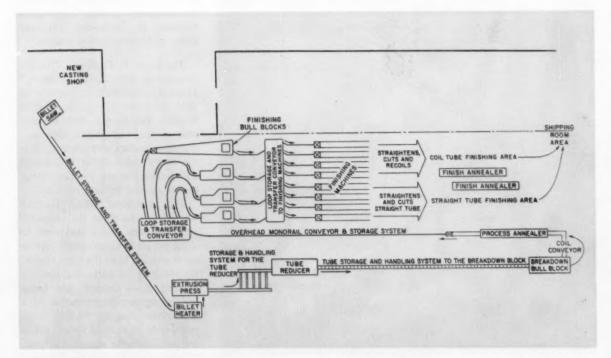
The breakdown operation makes a further draw and coils the tubing. The six foot coils pass by wide roller conveyor to an annealing furnace. Coming out of the furnace they're blown out by air. At a tipup point, an automatic "upender" loads the coil on the overhead monorail system.

Standard in size and length, tube coils now go to in-process storage on a loop transfer conveyor float, which is just ahead of the finishing bull blocks. This eliminates previous batch handling methods, whereby an overhead crane shuttled long bundles of tubes in and out of dead storage. Extra long lengths required two cranes working together.

Scheduling Now Easier—Paperwork and process scheduling have been streamlined also. Order scheduling begins at the storage conveyor and brings a big saving in time. Manual switches route individual tube coils into one of the four finishing bull blocks. The circular drawing operation reduces the coiled stock to scheduled size in as many passes as needed.

An integral handling system speeds work in each unit. As many coils as are needed for each order are run through the first reduction die. Each coil is automatically rehung on the monorail system of the bull block by a tip-up at the back of the machine. After the entire lot is run through, the operator changes the die and mandrel for the next reduction. Tubes run through successive draws until they attain the desired diameter.

Final straightening and cutting to length is done in automatic machines that require only manual loading and unloading. Separate finishing machines process tubing into straight or coiled form for shipping. Packing and shipping operations are being highly mechanized, also.



TIDY PACKAGE: Well planned layout for continuous production of tubing uses 40,000 sq ft less space than

former setup. Biggest space savers are the bull block coilers and overhead storage conveyors.

X-Rays Will Measure "Blind" Dimensions Accurately

Internal dimensions and contours are often critical. But you can't always measure them with conventional tools.

You don't have to guess or hope for the best on such dimensions any longer.

A new X-ray technique gives you a sharp picture of the part in an exact 1:1 size ratio.

■ A new X-ray technique measures dimensions inside sealed metal parts where mechanical measuring devices cannot be used. It was developed by Mr. Harlan Howard, radiographer for the Dalmo Victor Co., Belmont, Calif.

The company, maker of aircraft radar antennas and related airborne equipment, used X-rays regularly to check the soundness of various castings and welded waveguides. But its standard X-ray method could not measure accurately such critical internal features as: the contours inside feedhorns; the positions of irises placed in waveguides; wall thicknesses; dimensions of blind holes; and the distance between contact points in sealed relays.

Could It Be Done?—In seeking a way to avoid guesses and approxi-

mations of these inside dimensions, the Mechanical Inspection department posed this question: Could such measurements possibly be taken from an X-ray film?

"Not," says Mr. Howard, "with ordinary X-rays, which do not produce an exact 'shadow' of an object. It is possible,' he explains, "to make a fairly accurate X-ray picture by (1) keeping the object close to the film, (2) keeping the X-ray-source-to-film distance as large as possible, and (3) using the smallest possible focal spot in the X-ray tube. These are well-known procedures for making good X-ray pictures.

"But when dimensions must be measured in thousandths of an inch, certain problems crop up.

"For example, extremely small focal spot sizes are not available at times. Then, too, large source-tofilm-distances become impractical because of increasing exposure times and power requirements."

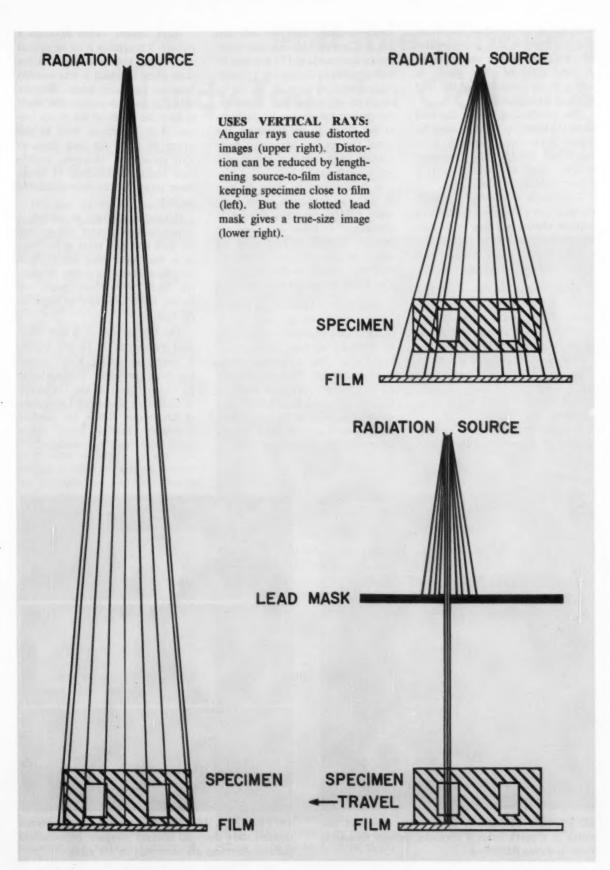
Thickness Is Problem—"As for keeping an object close to the film," Howard continues, "consider a thick part that you might want to measure with X-rays. Only the bottom of such an object, let's say, can be in contact with the film. The top of the thick object will distort the bottom unless parallel X-ray beams go past vertical sections."

The technique Mr. Howard worked out to solve the measurement problem uses a lead sheet to mask out all X-rays except a narrow beam coming from the tube source. By sweeping the part—and the film beneath it — through this beam (similar to the shutter action of a focal plane camera), the film is exposed only by vertical X-rays which are parallel to the sides of the part. The result is a picture in a 1:1 ratio.

Setup Is Simple—Essentially, the



SETUP IS IMPORTANT: Object to be X-rayed must be positioned accurately on motor driven table beneath slotted lead sheet and X-ray tube.



setup consists of a slotted lead sheet, 1/8 in. thick, which is suspended above a motor-driven Vernier table. A rigid plate of clear plastic is bolted to the underside of the lead sheet to strengthen it.

The smaller the slot in the lead sheet the better, as far as passing the direct X-ray beam through it is concerned. But, as the slot becomes smaller, more kilo voltage and/or slower table travel is required.

Experience shows that a 0.020-in. wide slot produces a satisfactory picture: objects less than ½ in. high can be measured to an accuracy of 0.0005 in.; parts up to 1 in. high can be measured to within 0.001 in.

Table Travel Fixed—A 10-rpm motor coupled directly to the lead screw of the Vernier table drives it in a horizontal direction at a rate of one inch per minute. This proves, for example, to be a good rate for exposing a 3/16-in. thick aluminum part on Ansco "A" film, using 125 kvp at 10 milliamperes and a 30 in. source-to-film distance.

For greater thicknesses, the table may be passed under the slot several times—provided the part and film are not moved. In one case three passes were made at 125 kvp and 10 milliamperes to distinguish a change in thickness of from 34 in. to 36 in. on an aluminum part. However, the greater the change in thickness at the points to be measured, the better the results. Measuring from changes in thickness of less than 5 pct is impractical.

It is important to place the part so that the dimension to be measured will traverse across the slot. If dimensions in other directions are desired, another picture must be taken because the slot filters out only the vertical X-rays perpendicular to the direction of travel.

Mounting Is Critical—In mounting the object to be measured, it is imperative that the vertical sides be perfectly so and parallel to a line from the radiation source through the slot. This can be done by first using a precision level on the Vernier table, then locating the slot at the point of the plumb-bob hanging from a point below the focal spot of the X-ray tube.

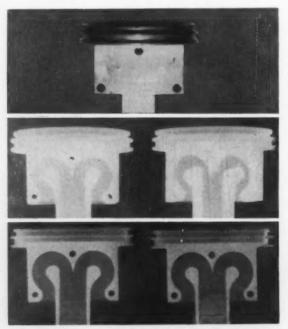
After Dalmo Victor develops a picture, it magnifies it on an optical comparator and measures it in the same plane in which it was scanned beaneath the X-ray beam. Because enlarging on the comparator tends to blur the edges of the X-ray image, it is sometimes hard to tell where to place the hair lines to start measuring. However, experience teaches technicians to locate these points within thousandths of an inch.

If greater accuracy is needed, a recording densitometer will enlarge the dark and light areas in the form of a line on a long chart. This simplifies measuring points by making them well-defined peaks on curves, rather than blurred edges on the film.

The Howard device is now being used extensively at Dalmo Victor. A somewhat similar X-ray system has been perfected independently by Helen Placas at the University of California Radiation Laboratory at Livermore. While her method accurately locates holes inside metal, size can't be measured.



MEASURES CLOSELY: Comparator magnifies film image of a part's internal contours, permits measuring them to within 0.0005 in.



DIFFERENCE IS CLEAR: Ordinary X-ray photos (center) show distorted internal contours. New-method pictures (bottom) are clear and in 1:1 ratio.

Portable Nibblers: Handy Tools for Odd Jobs

There's often a big advantage in favor of bringing the tool to the work.

It's one of the reasons why more and more shops are using portable nibblers for cutting sheet and plate.

■ Many plant maintenance departments find that a portable nibbler is one of the handiest tools on the shop bench. Weighing only 8 to 13 lb, these little hand-held punch presses are often just the things for cutting a few odd-shaped pieces from metal sheet or plate up to 3/16 in. thick. They're fast, they're accurate, and they don't waste metal.

It's no problem for a man to guide a nibbler along a scribed line or to keep it hugging a template around a curve or a sharp corner. As he does, the tool will chomp along, cutting at up to 5 fpm.

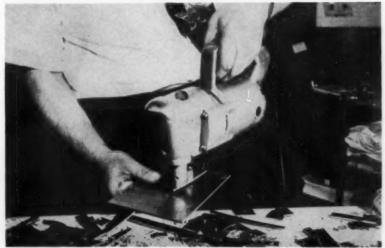
A nibbler works by true punch and die action. It saves metal by chewing out a narrow path, only 3/16 to ½ in. wide, and it does not distort metal at the sides of the cut. Vibration keeps the tool moving ahead to take rapid bites in 1/16 to 3/32 in. steps.

Easy to Use—You use a nibbler much as you'd use a portable jig saw in your home workshop. In most cases, you start right in on the edge of a sheet or plate to cut out the shape you want. If you need an opening in the center of a sheet, you'll need to cut about a 2-in. diam hole as a starting point for the nibbler head.

With a special attachment, a nibbler can cut corrugated sheet, too. The idea is to shift the nibbling head by 90° so it will ride over the corrugations more easily. Nibbler manufacturers make a number of quick-change head assemblies for handling special jobs. For example, the Fenway Machine Co. supplies a holder that's said to "permit cutting square corners without scrap loss." Portable nibblers are driven by electric motors. But for heavy plate work on long runs, there are floor stand models powered either by electricity or compressed air.



INSIDE CUTOUTS: These require a small starting hole for the nibbler head, then just follow the line.



FAST WORK: Guided by one hand, portable nibbler makes short work of cutting metal up to 3/16 in. thick.

How to Machine Laminated

By T. R. Silk-Plant Manager, Continental-Diamond Fibre Corp., Newark, Del.

Most of the areas in which working with plastics differs from machining metals are on the plus side.

Laminated plastics generally permit much higher speeds and feeds; lighter machines can be used than on equivalent metal work; and close tolerances or high finishes are a cinch.

■ Automatic or hand-operated screw machines are widely used in fabricating high-pressure laminates. Turret lathes fit in too, where the type of work to be done is generally heavier. These operations are about the same as for brass, except that plastics permit much higher speeds and feeds than do most metals.

High-speed carbide-tipped and diamond tools are excellent, ground about the same as for brass. Hand screw machines may operate up to 3000 rpm and automatic units up to 7000 rpm, with 1in. and 2-in. capacities respectively. A turret lathe may operate up to 1500 rpm at 4-in. diam capacity.

Most work is performed dry; some operations, like deep-hole drilling and threading (except on melamine or silicone grades), require a coolant, such as a mixture of 60 pct paraffin oil and 40 pct kerosene.

Forming and undercutting can be done, but care must be taken to use an extremely fine feed, preferably not over 0.0005 to 0.001 ipr. Many

attachments, fixtures, and magazine feeds can be used. Cams made of vulcanized fibre or laminated phenolic are economical on automatic screw machines where tool pressures are not too great.

Planing and Shaping - Plastic laminates, exclusive of glass-base materials, can be planed and shaped at 70 to 90 sfpm, using carbidetipped tools having 10° negative rake and about 20° clearance. For glass-base laminates, the surface speed should be 50 to 80 sfpm, with a feed of 0.010 to 0.015 in., side clearance of 30°, a cutting angle of 36°, and a shearing angle of 45°. No coolant is necessary. Care must be taken to prevent weakening. Set the tool so it cuts with a shearing action, to avoid lifting the laminations. The point of the tool should be radiused.

High-pressure plastic laminates can be readily punched, shaved, or broached. These operations are conducted without lubricant or coolant.

Punching—Some laminates can be cold punched, others must be heated before punching. Standard power vertical punch presses are used. Dies are progressive, compound, or multiple, with less clearance between punch and die or stripper than allowed in metal punching.

Laminates up to 1/16 in. thick in some paper-base materials, and up to 1/8 in. in most fabric grades, can be punched cold at room temperature (minimum 60°F). Glassmat polyester laminate up to 5/32 in. and glass-base silicone up to 1/4



PRODUCTION JOB: Automatic screw machine is a natural for high output, can be wound up to 7000 rpm on 2 in. diam laminated plastics.

This is the concluding article of a three-part series on machining laminated plastics. The first and second parts appeared in the May 1 and May 8 issues.

Plastics

in. thickness can also be punched cold. Generally it isn't advisable to do hot punching on any grade of glass-base laminate.

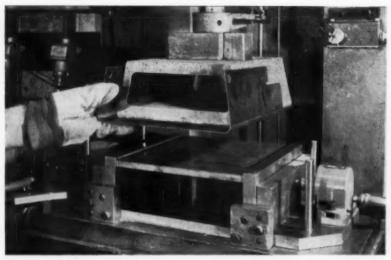
Heat where required for punching is provided by hot plate, oven, hot oil, or infrared lamps, the amount of heat depending entirely on the thickness and grade of material. In most cases 120°F, applied for 30 seconds, is enough, but temperatures as high as 250 to 275°F may be required for some grades. Punching may be done at speeds up to 300 strokes per minute.

Material Shrinks — In general, cold punching permits closer tolerances than hot punching, because of thermal contraction when the laminate cools. While this can be compensated somewhat by punching oversize (or by reaming), it's better to specify a cold-punching grade where possible.

Good holes are hard to make if the distance between holes, or between hole and edge of material, is less than 1.5 times material thickness. A good rule of thumb for maintaining center distances between holes on hot-punched material is to multiply the desired distance by 0.003 for each inch of center distance—e.g., if the desired center distance between holes is 4 in., the actual punching distance to be used will be $4+(4\times0.003)$ — 4.012 in.

Shrinkage allowances must be made when designing tools; in punching 1/16-in. thick laminate, piercing punches should be 0.002 in. oversize. Sides must be smooth, straight, and free from annular grooves or tool or grinding marks. Die and stripper clearance should be 0.001 in. on a side. Close stripper clearance is required to prevent delamination when the piercing punch is withdrawn from the hole.

Manual or mechanical feed, with



POSTFORMING SETUP: Flat sheets of plastic laminate are easily formed into simple or compound shapes by heating, then bending or drawing.



BARREL FINISHING: Standard tumbling methods are used to remove burrs, dirt and fuzz from laminated plastic parts after machining.

automatic stops and gages, can be used, as well as rotary-table feed mechanisms with vacuum or mechanical pickup.

On Glass-Base Laminates—Compound dies will give best results in punching or blanking by holding back the laminations during stripping. Carbide dies are preferred for glass, if the quantity involved permits the extra expense. Holes should be no smaller in diameter than the thickness of the sheet, and should be punched no closer to the edge than three times the sheet thickness.

Very close clearance between punch and die is required, and also on the stripper plate, to prevent lifting laminations around punched edges. Punch and die should be made oversize by about 3 pct on the thickness, to compensate for shrinkage. Punching of glass-base laminates is best done with the stock unheated. In blanking dies, some shear ground on the punch will decrease power needs, but hole punches should be ground flat with no shear. No back clearance is given to a hole punch.

The stroke of the press should be

such that the punch passes through the die completely to eject the part, rather than requiring the next part to push out the one before. Any chips or dust resulting from punching should be blown free of the die to prevent abrasion or hobbing of die parts.

Shaving—Irregularly shaped blanks too thick to punch may be shaved. This operation is fast and accurate and generally gives smoother edges than those obtained in punching. Oversize blanks are employed.

Combination punching, blanking, and shaving dies can be used for laminates up to 1/6 in. thick. These are known as double-decker dies; the blanked piece is pushed through the shaving cutter on the same stroke as the blanking operation.

Broaching—Broaching may be used to produce square, polygonal, or other regular or irregular shaped holes, keyways, and the like. A special procedure is necessary because of the laminated structure of the material. When cutting across laminations, the material must be backed up with a mild steel or brass plate, which forms a slide fit with the last cutting tooth of the broach. This

prevents fraying and breakout.

When cutting is parallel to the laminations, a fixture should be used to apply pressure at right angles to the laminations. Ample chip room between teeth of the broach should be provided; take a cut of 0.001 to 0.005 in. per tooth with pitch ranging from 1/4 to 3/4 in., depending on grade and thickness of the laminate.

Forming and Drawing — Postforming is the technique of shaping
and forming simple or compound
contoured parts from cured, flat
sheet laminates. It consists of heating the cured laminate sheet to make
it flexible and pliable; shaping, bending or drawing the heated sheet in
jigs, fixtures, or molds; and holding
the material in the new shape while
the resin binder cools and rehardens. While resins used in laminated
plastics are thermosetting, they are
nevertheless thermoelastic enough
for postforming.

Reinforcements may be any type that'll extend during forming without tearing or damage to the individual filaments, fibers, or web. Most generally used are fabric weave materials such as ducks, twills, and herringbone weaves, and single- or double-filled duck cloths.

Glass fabric and glass mat rein-

forcements have been used experimentally, but are limited to simple bends and shallow draws. Industrial paper-base forming material has not found as wide usage as fabric bases due to its lower strength, but for certain applications its lower cost makes it an acceptable substitute.

Fibre Works Well—One of the most important properties of Diamond vulcanized fibre is its ability to be formed into permanent shapes when properly manipulated. The fibers actually flow when moisture, heat, and pressure are applied, then set as heat and pressure remove the moisture. Such formed parts retain their shapes permanently.

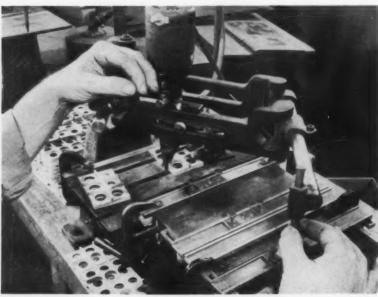
Many simple forming operations can be performed on fibre in regular punch presses. Fibre is readily bent in an angle brake when moist. More complicated shapes are formed or drawn in punch presses or hydraulic presses. Repeated moistening and drying won't alter the structure or quality of the material.

Postforming Laminates—Certain CDF Dilecto grades of laminated plastic have been given thermoelastic properties. After the sheets are laminated they may be formed to special shapes by heating and placing in a cold mold, thus in effect postforming them.

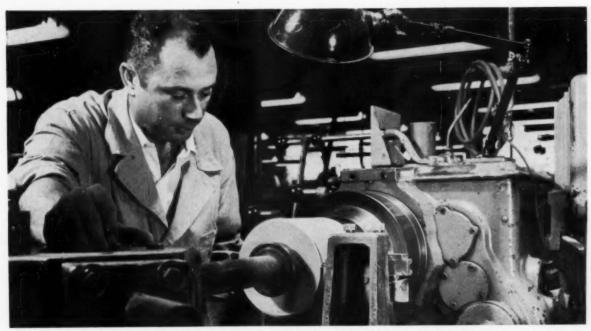
Different methods of heating can be used in postforming plastic laminates; these include infrared lamps, electric ovens with circulating air, electric strip heaters, hot plates, and immersion in molten alloys or hot oil. Forming tools are made of a variety of materials, such as hardwood, cast or laminated plastics, steel and other metal alloys.

Pressures are applied manually or by hydraulic or pneumatic presses, the amount of pressure depending on the grade and thickness of the material and complexity of draws and bends in the part. Dilecto is heated to between 300 and 350°F just before forming, the time and temperature being dependent on the thickness of the material and the heating medium.

Sanding and Grinding - Sanding



ENGRAVING: Pantograph-guided tool engraves identifying marks on plastic parts. Markings can then be filled for greater legibility.



GOOD TURN: Turret lathes cut laminates at high speeds and feeds, is especially suitable for heavy work.

is used to face and shape surfaces, to roughen a surface for gluing, or to remove burrs and sharp edges from the piece. Grinding finishes the piece to close tolerance and insurés parallel opposing surfaces.

Machines for sanding, grinding, or polishing are the same as those used for similar operations on metal or wood. They include bench and disc sanding units found in the average metal shop, as well as the largest units found in the plywood industry. Surface sanding on drum-type machines may be used to finish work to extremely close tolerances, with abrasive belts and discs ranging from 40 to 240 grits and operating up to 2000 fpm.

Sanding may be either dry or wet—dry sanding making use of a relatively coarse paper (120 to 160 grits to the inch). Wet grinding involves cooling the work in a special machine; water or some other coolant is needed to prevent partial softening of the resin and embedding of the grit particles in the laminate surface. Wet sanding with paper as fine as 180 to 220 grits to the inch provides a satin finish.

Double-spindle grinders can be used for grinding two opposite parallel surfaces at the same time. Grinding takes place at speeds up to 5000 fpm, with abrasive wheels varying from coarse to very fine. Coolants are generally used to prevent overheating of the tool and marring of the laminate.

Tumbling — Fabricated laminate parts are tumbled in standard revolving barrels to remove undesirable burrs, dirt, and fuzz. Various polishing agents are used. After the parts have been cleaned, an oil-saturated cloth is placed in the barrel and permitted to remain for a short time while the barrel revolves; this puts a thin film of oil on the pieces to protect them and improve their appearance. Wheelabrator units permit close control of finishes.

Laminates may be buffed and polished by standard methods, using conventional rag buffing wheels, polishing wheels, and rouge. Brilliant finishes are obtainable on various grades if consideration is given to their individual coefficients of heat transmission, in order to avoid softening of the surface resins and embedding of abrasives.

Centerless grinding, a standard operation in finishing tubes and rods

(either rolled from laminates or molded), is done with a silicon-carbide wheel that runs at speeds of about 900 sfpm. Many types of tubing use a vertical belt sander for additional finishing, grit size depending on the degree of finish required. To obtain a buffed finish, a speed of 4000 to 6000 fpm is used, with coolants.

Marking — Laminates may be marked with characters, numerals, printed instructions and the like by engraving, stamping (either hot or roll leaf), and printing. Engraving and stamping are recommended for greatest resistance to wear. Engraved characters are rendered more legible by filling with white or colored lacquers or enamels.

A special grade of laminate is made just for engraving, with a black surface and white core to eliminate need for subsequent filling of engraved characters.

Reprints of this article are available as long as the supply lasts. You may obtain a copy from Reader Service Dept., The IRON AGE, Chestnut & 56th St., Philadelphia 39, Pa.

Cold Forging Strengthens Jumbo Bolts

A new cold forging and thread rolling machine puts more strength and fatigue life into king-sized bolts.

Test results compare the properties of cold-forged fasteners with those of bolts produced in conventional ways.

■ Big (% to 1¼ in. diam) steel bolts can be made stronger and much more resistant to fatigue failure. The trick is to cold form them—heads as well as threads—on a cold forging machine like the half-million-dollar mogul recently installed by the Cleveland Cap Screw Co.

First test studies on the fully cold forged jumbo fasteners show them to have superior properties. For example, they have double the fatigue strength and 12 pct more tensile strength than wholly machined fasteners or those with hot forged heads and machined threads.

Until late last year, these latter means were the only ways to mass produce headed and threaded parts above ¾ in. in diam. Then the Cleveland subsidiary of Standard Pressed Steel Co. pushed the "start" button on its huge new Boltmaker.

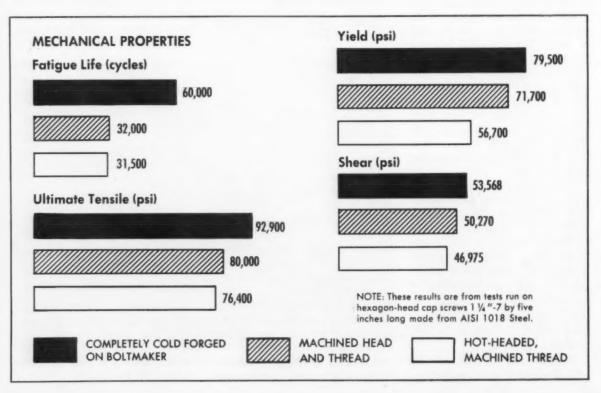
Forges and Rolls—This machine cold forges the head and fillet, extrudes the right diameter for roll threading, then proceeds to point and roll threads in a continuous operation. It makes hexagon head cap screws and bolts, also square head and high strength structural bolts in the 7/8 to 11/4 in. range.

The cold heading action produces

a uniform washer face and fillet radius under the head of the fastener. Thread rolling then adds its beneficial cold working effect to this critical performance area.

The combination of these two techniques maintains a strong, unbroken pattern of grain-flow lines in the bolt. And because the work is done cold, there is no chance for the bolt head to scale or decarburize.

Tests to compare the properties of cold forged, wholly machined, and hot forged and machined outsized cap screws were made by SPS Laboratories, Jenkintown, Pa. Each test piece was 1½ in. in diam, 5 in. long, with 7 threads per inch. All were made by Cleveland Cap Screw from AISI 1018 steel. Results are summarized in the accompanying graph.





DROTT 4-IN-1 SKID SHOVEL built lighter and stronger with USS "T-1" Steel. Can be used as a buildager, bull-clam shovel, clamshell or skid shovel. Can load trucks or freight cars.

USS

"T-1" Steel reduces weight of 4-in-1 bucket by 35%, boosts payload by 1,200 pounds

"Our engineers specified USS* 'T-1' heat treated alloy steel in the construction of our 4-in-1 skid shovel bucket because we could reduce the original weight by 35%. What's more, we could add one-half yard to the bucket capacity," says Mr. Edward Drott, President and Chief Engineer, Drott Manufacturing Corporation, Wausau, Wisconsin.

The entire Drott bucket is fabricated from USS "T-1"* Steel which has a minimum yield strength of 90,000 psi, nearly 3 times that of structural carbon steel. This strength helped to make the weight reduction possible

. . . and the reduced weight on the front end of the tractor improved the balance and increased efficiency.

50% longer wear. Drott buckets made of "T-1" Steel have now been in rugged service about two years. Because of "T-1" Steel's high resistance to impact abrasion, the buckets will last 50% longer than those made of lower strength steel.

Strength after welding. USS "T-1"
Steel was found to retain its strength after being welded or flame cut. This was an important factor in design.

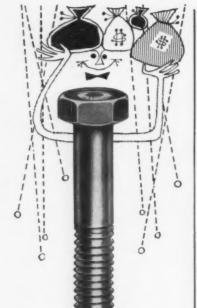
Sub-zero toughness. Even at 50° below zero, USS "T-1" Steel retains its

high resistance to shocks and jolts in rugged work.

Build better with USS "T-1" Steel. No other steel possesses the remarkable combination of high yield strength, toughness and weldability found in "T-1" Steel. It may be the answer to your problems for many different types of mining and construction equipment. Remember that we also make USS COR-TEN*, USS TRITEN* and USS MAN-TEN* high strength steels . . . standards for heavy-duty equipment. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

United States Steel Corporation - Pittaburgh Columbia-Geneva Steel - San Francisce Tennessee Coal & Iron - Fairfield, Alabama United States Steel Supply - Warehouse Distributors United States Steel Export Company





YOU'LL BE DOLLARS AHEAD WITH ALCOA ALUMINUM FASTENERS

You save dollars when you use Alcoa® Aluminum Fasteners . . . the lowest cost, corrosion-resistant fasteners available. They are a perfect color match for the aluminum products you make, and they insure against both galvanic and atmospheric corrosion. For your requirements, call your nearest Alcoa sales office, Alcoa Aluminum Fasteners . . in all standard types and sizes . . are readily available from the complete stocks of your local Alcoa distributor. Look in the Yellow Pages of your telephone directory. Alcoa is a "natural" for specials, too!





Your Guide to the Best in Aluminum Value

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FREE TECHNICAL LITERATURE

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 93.

Rotameters

Armored rotameters shown in an 8-page brochure handle pressures up to 5000 psi and flow rate equivalents up to 3000 gpm of water. Precision pressure - formed metering tubes dimensionally reproducible to the same accuracy as glass tubes are used in the new meters. (Brooks Rotameter Co.)

For free copy circle No. 1 on postcard, p. 93

Stepping Motors

Rotary solenoids, selectors and stepping motors are briefly introduced in a 4-page bulletin. (G. H. Leland, Inc.)

For free copy circle No. 2 on postcard, p. 93

Rubber Products

Rubber compounding and molding is discussed in a well-illustrated 16-page publication. It reviews one firm's extensive facilities for filling rubber needs. (Colonial Rubber Co.)

For free copy circle No. 3 on postcard, p. 93

Punch Press

New literature announces an 8ton safe punch press. "Completely safe in the die area," the press has two control buttons which must be depressed and released to complete a stroke. The operator's hands cannot possibly be in the danger area during the punching period. (Kenco Mfg. Co.)

For free copy circle No. 4 on postcard, p. 93

Electrode Holders

Electrode holders in a new line employ a ball-point type cable connection. Using the connection, a holder can be installed on a welding cable in less than two minutes. A 12-page catalog describes them. (Tweco Products, Inc.)

For free copy circle No. 5 on postcard, p. 93

Cold-formed Shapes

Containing 48 pages, a handbook explains basic principles of roller die, cold forming metal shapes. Material selection, roller dies, forming mills, tolerances for roll forming and typical metal shapes are covered. (Van Huffel Tube Corp.)

For free copy circle No. 6 on postcard, p. 93

Aluminized Steel

Aluminized steel dealt with in a 6-page folder resists and reflects heat and stays strong in elevated temperature service. (Armco Steel Co.)

For free copy circle No. 7 on postcard, p. 93

Color Coding

A new color code kit supplies all materials and information necessary to design a color coding system. Color coding is used widely where steel bars, rods, etc., are used in quantity—and wherever identification of crates, boxes, or products

"in-process" is desirable. (For free copy write on company letterhead to Crown Industrial Products Co., 1001 Amsterdam St. Woodstock, Ill.

Electric Motors

Electrically operated motors are described in a 16-page brochure. Many types are illustrated. (Delco Products Div., General Motors Corp.)

For free copy circle No. 8 on postcard, p. 93

Conversion Coats

Protective and prepaint coating chemicals for aluminum are discussed in a bulletin. It reviews advantages of the coatings, methods of application, and equipment used in the processes. (American Chemical Paint Co.)

For free copy circle No. 9 on postcard, p. 93

Galvanizing

Two reprints describe the use of induction furnaces for galvanizing. The refractory lined hearth, which eliminates one of the main sources of dross formation, and the ability of rapid alloying in the bath and maintaining an alloy to specifications, are particular advantages of the induction furnace for galvanizing. (Ajax Engineering Corp.)

For free copy circle No. 10 on postcard, p. 93

V-belts

Swedish V-belts and endless flat cord belts are detailed in a 20-page catalog. (Homestrand, Inc.) For free copy circle No. 11 on postcard, p. 93

Press Rebuilding

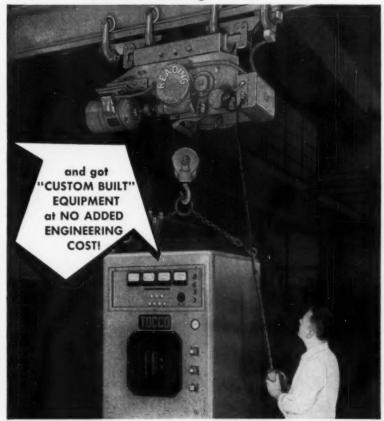
Special facilities and techniques used in rebuilding older presses are reviewed in an 8-page bulletin. (E. W. Bliss Co.)

For free copy circle No. 12 on postcard, p. 93

Fabricating Stainless

Packed with data, a new 386page book deals with the fabrication of stainless steel. It contains more than 140 photographs, 120 charts and graphs and about 200

TOCCO Chose Reading Electric Hoists ...



This Reading electric hoist is moving a sheet metal cabinet from a heating station to the production line. All Reading hoists at Tocco have the same two-button pendant control.

• Rapidly rising production goals are being met in Ohio Crankshaft's new Tocco Division plant in Cleveland's South Side . . . thanks partly to Reading Electric Hoists.

Tocco, a leading producer of induction heating equipment, designed the new plant to meet the needs of its rapid expansion. Pre-planned materials handling, involving trucks, bridge cranes and electric hoists, is paying off in fast, orderly movement of materials from operation to operation.

Playing a big role in this integrated handling system is a series of Reading electric hoists, "custom-built" from standard Reading units to meet the exact requirements of each operation. These hoists permit Tocco workmen to move all material without manual lifting.

Reading's unique "Unit Construction" plan offers you special equipment for your own plant at the low cost of standard parts. Investigate now this proven way to get faster, better materials handling. A note on your company letterhead will bring a Reading engineer to analyze your handling operations . . . at no obligation.

Reading Crane & Hoist Corporation, 2101 Adams St., Reading, Pa.

READING HOISTS

HOISTS

OVERHEAD TRAVELING CRANES ELECTRIC HOISTS



IMPORTANT MESSAGE FOR STEEL BUYERS!

You get Maximum Production Efficiency when you take advantage of our

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- Fast Delivery
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More and more companies are learning that it really pays to make full use of their local Steel Service Centers, such as Wheelock, Lovejoy.

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without scrap and wastage . . . without the considerable costs of maintenance and floor space, handling and cutting equipment, taxes and insurance.

Moreover, their needs are filled FAST, due to the speedy local delivery service we offer.

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Our complete facilities, service, and stocks are at your disposal. Call in your nearest Wheelock, Lovejoy representative. He will gladly show you how to get the most benefit out of the services we offer.

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special diagrams on the making of stainless into usable products. (For free copy write on company letterhead to: Advertising Dept., Allegheny Ludlum Steel Corp.)

Stainless Casting

Specialized stainless steel and alloy casting facilities using economical "plastic steel" patterns are described in a 4-page brochure. (Alloy Steel Casting Co.)

For free copy circle No. 13 on postcard, p. 93

Carbon Steel Balls

Low-cost commercial - type carbon steel balls are described in a 4-page bulletin. (Hoover Ball and Bearing Co.)

For free copy circle No. 14 on postcard, p. 93

Wire Rope

Storage and lubrication of wire rope are explained in a bulletin. Proper procedures to follow when either new or used wire rope is to be stored are described in detail. So are various steps to take when the rope is put back into service. (Leschen Wire Rope Div., H. K. Porter Co., Inc.)

For free copy circle No. 15 on postcard, p. 93

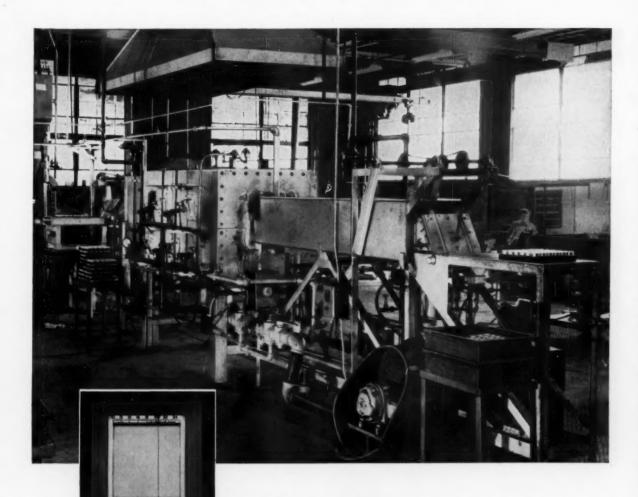
Twist Drills

Carbide-tipped and solid carbide twist drills for non-metals, are analyzed in a "tooling tip sheet." Both drills, designed for working in plastics, resinoids, pressed fiber, hard rubber, and other non-metals, are described. (Wendt-Sonis Co.) For free copy circle No. 16 on postcard, p. 93

Precision Metals

An 8-page brochure introduces facilities and products of a large precision metallurgical company. Boasting a completely integrated metals processing plant, the firm precision cold-rolls strip and foil to ultra-close tolerances. (Precision Metals Div., Hamilton Watch Co.)

For free copy circle No. 17 on postcard, p. 93



Speedomax^e H...holds critical sintering temperatures in line at Burgess-Norton

Mix... press to a density between 6.2 and 6.6 gms/cc... and sinter under good conditions for fifteen minutes at temperature! That's the formula for quality sintered steel parts at Burgess-Norton where many millions of such parts—ranging from small bushings to 4" diameter gears—are turned out a year. Most of these parts are used "as sintered." Some may be further hardened, carburized or plated.

Good sintering conditions include a sintering furnace, like the Surface Combustion furnace shown, and straight-line control of the critical zone as provided by the Speedomax H controller above. An ammonia dissociator, also under L&N temperature control, provides the neutral atmosphere for the sintering furnace.

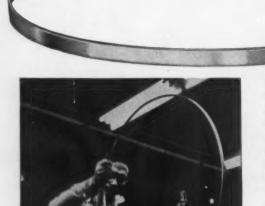
One of the most important determinations of the sintering process is temperature. If tempera-

ture is too high or too low, size and strength will be adversely affected. With Speedomax H 3-Action Position-Adjusting Type control, the sintering temperature is held well within critical limits . . . practically eliminating rejects due to improper sintering.

When installing your next heat treating furnace—whether it's electric or fuel-fired, continuous or batch—it'll pay you to investigate Speedomax H control. A phone call or letter to your nearest L&N office—or to 4956 Stenton Ave., Philadelphia 44, Pa.—will bring more information.



Precision Rings with little or no machining



Today you can purchase precision flash butt-welded rings that require little or no machining to meet your specifications. Made from bar stock of finished gauge, they can be produced to meet the same tolerances as conventionally machined rings. Cost of production and materials of some rings has been reduced as much as 60%. Sizes and materials at present are limited to those bar stocks which can be furnished to precise finished dimensions. However, persistent efforts of American Welding engineers and the producers of finished bars give promise of a widening range of sizes and metals that can be manufactured by precision forming and welding.

This is another example of why you should call American Welding first - if the problem is circular and of metal.



New Products Catalog

Write today for 20-page catalog of circular products which American Welding can form, weld and machine for you.



AMERICAN WELDING

THE AMERICAN WELDING & MANUFACTURING CO. 120 DIETZ ROAD . WARREN, OHIO

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Conveyor Furnaces

Conveyor furnaces, described in a 4-page bulletin, develop to 2100°F. Using variable speed electronic drive, these units possess several unique design features. They handle soldering, brazing, annealing, enameling, sintering, hardening, degassing and other jobs. (C. I. Hayes, Inc.)

For free copy circle No. 18 on postcard

Fastener Facts

A file of fastener facts contains design and purchasing information on rivets and riveting machines. The folder includes 42 pages. (Judson L. Thomson Mfg. Co.)

For free copy circle No. 19 on postcard

Guided Missiles

All known military guided missiles are listed in an 8-page publication. Compiled from government sources, it's up to date as of Feb. 10, 1958. It gives names and addresses of prime contractors and component sub-contractors. (La Salle Steel Co.)

For free copy circle No. 28 on postcard

Tubing or Bars?

When should you use tubing instead of bar stock in making steel parts? After asking this question, a bulletin discusses the pros and cons of both. It also includes a tubing selection chart. (Joseph T. Ryerson & Son, Inc.)

For free copy circle No. 21 on postcard

Barrel Finishers

Precision barrel finishing machines for high production are de-

scribed in a 4-page bulletin. It cites savings of more than 800 pct or more on large quantity runs. (Speed-D-Burr Corp.)

For free copy circle No. 22 on postcard

Turret Machine

A 6-page folder describes a new 6-spindle turret machine. This power indexing turret has pre-selective spindle speeds and pre-selective depth control. (Burg Tool Mfg. Co.)

For free copy circle No. 23 on postcard

Coolant, Lube Filter

A 4-page bulletin describes operating principles, filtering efficiency and applications of a dual manifold filter. Basic applications of the unit are: filtration of coolants, cutting oils, honing oils; filtration of water from wet type dust collectors. (Industrial Filtration Co.)

For free copy circle No. 24 on postcard

Electric Motors

Fan and blower shaded pole motors are presented in a 12-page publication. It includes information on a "slim" motor that's 33 pct lighter in weight than previous models. (General Electric Co.)

For free copy circle No. 25 on postcard

Wet Classifiers

Classifiers, hydro-separators, washers and heavy media separators are described in a bulletin. Consisting of 24 pages, it devotes a large section to new "overdrain" classifiers. (Hardinge Co., Inc.)

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Packaging Material

A new corrugated interior packing material is the subject of a 4page folder. It says this material has unusual adhesive and cushioning qualities. (Hinde & Dauch)

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Ground Flat Stock

A 22 x 28-in. wall chart simplifies selection of ground flat stock. The right size for every job reduces unnecessary machining, saves material Postcard valid 8 weeks only. After that use 5/15/58 own letterhead fully describing item wanted.

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FREE LITERATURE

and greatly speeds up the fabrication of tools and gages. More than 1500 standard sizes are listed. (The DoALL Co.)

For free copy circle No. 38 on postcard

Instrument Repair

A new four-echelon factory instrument repair service is now available. A folder gives details. (Leeds & Northrup Co.)

For free copy circle No. 20 on postcard

"Cloth" Paper

A 6-page brochure introduces a new product having many of the qualities of fabric and the economical advantages of paper. (Scott Paper Co.)

For free copy circle No. 30 on postcard

Abrasive Units

Flat surface disc grinders, abrasive discs and cylinder wheels are described in a bulletin. It illustrates basic types of disc grinders, work carrying fixtures, variety of shapes and sizes of workpieces ground, automation in disc grinding, and the range of sizes and types of faces of abrasive discs. (Gardner Machine Co.)

For free copy circle No. 31 on postcard

Custom Fabrication

Just published is a bulletin which details facilities, services and qualifications of an equipment fabricator. Factors that assure production according to specifications and delivery as scheduled are covered. (Niagara Welding & Boiler Works, Inc.)

For free copy circle No. 22 on postcard

Stabilized Ceramics

Stabilized ceramics are subjects of a technical bulletin. Covered are properties of three new engineering materials: (1) nitride bonded, (2) recrystalized or self-bonded and (3) a coating. These ceramics withstand temperatures too severe for metals. They offer high resistance to thermal shock and extreme tempera-

tures, some as high as 4000°F. (Norton Co.)

For free copy circle No. 33 on postcard

Steel Lockers

A catalog describes a new line of steel storage lockers. Twelve locker styles are presented. (Penco Metal Products Div., Alan Wood Steel Co.)

For free copy circle No. 34 on postcard

Manganese Steel

An almost unlimited variety of applications for a tough, wear-resistant rolled and forged high-manganese steel appear in a dozen-page leaflet. The true 11 to 14 pct manganese steel conforms exactly to the original Hadfield analysis, producing a dense, uniform, fine-grained structure. (Manganese Steel Forge Co.)

For free copy circle No. 35 on postcard

Optical Measuring

Precision optical measuring instruments used on production or inspection equipment requiring accurate, reproducible linear settings are the subject of a 6-page folder. The folder tells how the instruments provide longitudinal, crosswise, or vertical settings to 0.0001 in. (F. T. Griswold Mfg. Co.)

For free copy circle No. 36 on postcard

Drawing Lubricants

Choose your press drawing lubricants with care, warns an 8-page brochure. It deals with components of drawing lubricants and gives a complete classification of press drawing compositions. (Magnus Chemical Co., Inc.)

For free copy circle No. 37 on postcard

Closed-circuit TV

One maker's low-cost closed circuit television systems now in use are outlined in a 16-page booklet. These use typical closed circuit TV camera systems, applications, and equipment. (Blonder-Tongue Laboratories, Inc.)

For free copy circle No. 88 on postcard

what makes this fastener DIFFERENT?



Several things. Rollpin® is a slotted, chamfered, cylindrical spring pin which drives easily into a hole drilled to normal production standards. It locks securely in place, yet can be drifted out and reused whenever necessary. This eliminates special machining, tapping, and the need for hole reaming or precision tolerances. Rollpin replaces taper pins, straight pins and set screws; for many applications it will serve as a rivet, dowel, hinge pin, cotter pin or stop pin.

And here's another difference that makes Rollpin the quality fastener in the field: ESNA's quality control builds consistent strength and performance into every Rollpin. Rollpin is uniform as to shear strength, dimensions, hardness, and insertion and removal forces

HOW YOU INSERT IT

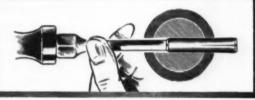


eronces

Drives easily by hammer, arbor press, or air cylinder and can be readily adapted to an automatic hopper feed. Requires only a standard hole, drilled to normal production-line tol-



Locks securely in place without using a secondary locking device; won't loosen despite impact loading, stress reversals, or severe vibra-



Removes readily with a drift pin without damage to pin or hole, can be used again and

HOW YOU SAVE

You pay less for Rollpins than for most tapered, notched, grooved or dowel pins. Installation costs are substantially less than for any fastener requiring a precision fit or secondary locking operations.

Because of their tubular shape, Rollpins are lighter than solid pins. Production maintenance is reduced with Rollpins: they do not loosen and because of their spring action they tend to conform to the drilled hole in which they're inserted, without material hole wear, eliminating the necessity of re-drilling or using oversize pins.

MATERIALS AND SIZES

Standard Rollpins are made from carbon steel and Type 420 corrosion resistant steel. They're also available in beryllium copper for applications requiring exceptional resistance to corrosive attack, good electrical, anti-magnetic, and non-sparking properties. Stock sizes range from .062" to .500" in carbon and stainless steels.



ESIÓ

ELASTIC STOP NUT CORPORATION OF AMERICA

R40-577 2330 Youxhall Road, Union, New Jersey Please send me the following free fastening information:

Policio Bullatio

Rollpin Bulletin
Elastic Stop nut Bulletin

Here is a drawing of our product. What self-locking fastener would you suggest?

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THE IRON AGE, May 15, 1958

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- Send sample pellets for ______e temperature

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TECHNICAL BRIEFS

Single Machine Now Does Work of Two

Teaming two machining operations into one pays off for a tractor parts maker. The one unit handles a dozen different sizes, too.

What's more, tooling is very simple, easy as changing a cartridge clip on a rifle.

Telescoping two machining operations into one generally pays off on any production floor. It saves on floor space, if nothing else. However, engineers of a large diesel engine maker discovered that combining two crankshaft machining jobs brings many other advantages.

In addition to other assets, they find that the new single setup eliminates once-necessary handling procedures. Versatility is a not her reward: The unit works several surfaces of irregularly shaped parts in nearly a dozen different sizes.

Demands Good Work—Careful machining of the forged steel crankshafts is very important to Caterpillar Tractor Co., Peoria, Ill. A heavy portion of the firm's reputation is based on performance of engines using these shafts. The company processes in the same department crankshafts in 11 sizes; types range from 4 to 6 throws.

Until recently, these forged workpieces were handled on two machines. One, a center drive lathe, turned bearings, flanges and stub ends. A double-end drive machine turned all remaining intermediate bearings.

Spent Time—Tooling these machines was time consuming. Accuracy of the setups, which involved as many as 33 cutting tools, hinged on the abilities of two operators. One ran each machine.

Today, one machine does the job. Tooling is almost as simple as changing a cartridge clip on a rifle. Produced by Wickes Corp., Saginaw, Mich., the new machine is a double-housing, 36-in. center-drive bearing lathe. It requires the services of only one operator. It cheeks, turns and fillets all bearings,



This lathe removes some 67 lb of metal off the crankshaft.

flanges and stub ends of each crankshaft simultaneously.

Retooling Is A Cinch—Shifting from one to another type and size crankshaft is no problem. Retool-

Want More Data?

You may secure additional information on any item briefed in this section by using the reply card on page 93. Just indicate the page on which it appears. Be sure to note exactly the information wanted. ing consists simply of removing a special mounting plate, which holds the necessary cutting tools, and remounting another. These mounting plates are all pretooled for each type and size shaft. They are stocked in the tool crib.

Coating

New process puts thick aluminum layer on steel

Thick coats of aluminum put on steel wire via a new process result in a strong, corrosion-resistant electrical conductor.

Developed by metallurgists at Battelle Memorial Institute, Columbus, the new process is described as unlike existing ones for coating steel wire in a bath of molten aluminum. It's the result of an extensive research program sponsored by Copperweld Steel Co. Its developers say the wire has "the strength of steel along with high conductivity and corrosion resistance."

Thickness Is Uniform-The aluminum covering may be applied to a thickness not previously possible. It's this heavier aluminum layer which increases electrical conductivity. Moreover, the continuous process lends itself to automation. And it produces an aluminum coating not only thick but remarkably uniform.

Aluminum and steel in the wire are joined by a strong, ductile metallurgical bond. The brittle intermetallic compounds which often occur when aluminum is applied to steel are eliminated in this process.

Maintenance

Group relighting programs can pay big dividends

Manufacturing plants and offices find that group relamping pays off in better lighting. Not only is the lighting level kept higher, but interim burnouts are reduced.

The program at Equitable Life Assurance Society's New York office building is a good example. Working with engineering recom-

everything you need to fasten anything with screws

SCREWDRIVING TOOLS

- you drive thousands of screws every day, or just a few-
- you use one size or several sizes of screws-
- you use Phillips, slotted, socket head or any other kind of screws-
- you work with case-hardened, sheet metal, heat treated, wood or any other type of screws-
- you use manual or power tools, or even multiple units to drive screws-

you can use, to good advantage, Apex THEN screwdriving tools designed especially for your type of screwdriving work. For most applications, just choose the correct Apex tools from the most complete line ever offered. For special applications, just ask Apex -the authority on fastening-for practical assistance in solving your problem.

> Write, on your company letterhead please, for Catalog 21-Apex Screwdriving Tools, or Catalog 25-Magnetic Fastening Tools.

APEX BUILDS TOOLS TO DRIVE ALL THESE TYPES OF SCREWS:



PHILLIPS



(Reed & Prince)



SLOTTED





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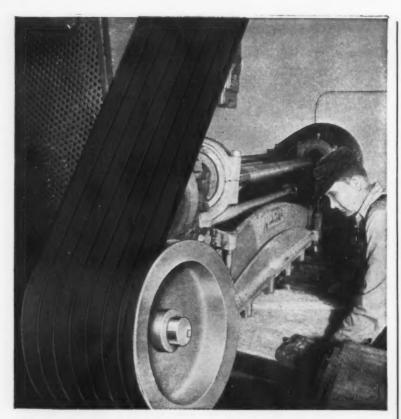
1933

A Quarter Century of Service to Industry

1958



FASTENING



Industry's No. 1 choice... the V-Belt with concave sides

Here's the reason: the concave sides of Gates V-Belts insure far longer belt life.

Make this simple test. Bend a Gates V-Belt with concave sides (Fig. 1) as if it were going around a sheave. Feel how the sides fill out... become perfectly straight (Fig. 1-A). Note how this belt makes full contact with the sides of a sheave... grips the sheave evenly, distributing wear uniformly across the sides of the belt. Uniform wear lengthens belt life—keeps costs down.

Now make the same test with a straight-sided belt (Fig. 2). Feel how the sides bulge out, (Fig. 2-A) concentrating wear at the points shown by arrows. Uneven wear shortens belt life; increases belt costs.

Because Gates V-Belts with concave sides are so universally preferred, they are also the *most widely* available. There are Gates distributor stocks in industrial centers throughout the world.

The Gates Rubber Company

Denver, Colorado World's Largest Maker of V-Belts



TECHNICAL BRIEFS

mendations of Westinghouse Electric Corp., Bloomfield, N. J., a lighting crew cleans and washes fluorescent fixtures every year and relamps them every two years.

How It's Done—Five men working Friday nights and Saturdays keep the lamps in shape. Four men on individual scaffolds working across a room do the work. A fifth man handles the "glass" trucks and



Mass-cleaning of fixture glass speeds job, improves lighting.

generally helps out. They clean every year and replace the 31,502 lamps every two years.

During relamping the crew tags defective ballasts and sockets for the maintenance man. As a result, only about six trouble calls are made each day.

Labor Costs Low—Equitable estimates that the labor cost of group relamping is 6.9¢ more per lamp than the cost of cleaning alone. The relamping period depends on off-and-on cycle per day as well as burning hours per year. The firm leaves its lamps on up to 15 hours a day, which results in a long period between replacements.

Controls

THE CONCAVE SIDE

Temperatures of any solid, liquid or luminous flame in the 1500 to 4000°F range can now be measured

without need for making emissivity corrections. A new type instrument does the job.

The unit employs a radical approach to temperature measurement. This eliminates human factors, provides accuracy to within 20°F and permits use of automatic controls previously considered impractical.

It can measure temperatures of flowing molten metals, or of moving objects in a furnace rather than the furnace temperature. Readings can translate automatically to control processing.

The radiation ratio pyrometer also keeps checking on small temperature changes in large or small objects.

Shaw Instrument Corp., Pittsburgh, is the instrument's developer.

Handling

Special "bolt down" pallets speed handling of engines

Precision-made steel "bolt down" pallets for interplant transportation help solve a farm equipment engine maker's tough handling problems. Plant engineers report time savings in loading and unloading by eliminating truck dunnage.

Engines are bolted on the pallets at the John Deere tractor plant at Dubuque, Ia., and trucked to their



Fork truck lifts engines on the steel pallets with ease.

Harvester Works in Moline, Ill. The engines remain on the pallets and are moved easily to either temporary storage or production line.



radiant heating news

to help manufacturers improve production operation

Get these 5 answers before you buy infrared ovens today...

While infrared provides the fastest, lowest-cost and most easily controlled of all production heating methods, there are a number of factors you want to consider thoughtfully when buying radiant ovens. Getting answers to these five pertinent questions beforehand will guarantee results that give you the satisfaction—and profit—you want.

Q Have you chosen the right type of infrared heat?

Just as gas, electricity and oil offer a choice of fuel in convection ovens, various types of infrared heat sources are available for radiant type ovens. Clear lamps . . . quartz lamps, quartz tubes . . . metal rods . . . all have distinct advantages depending on application, heat rating desired, processing speed and often, cost.

One is right for your purpose. The advantage of dealing with a supplier experienced in all types is obvious. Fostoria has the advantage that comes from being the pioneer in manufacturing radiant equipment, with skill and know-how to help you choose the right type of infrared.

Q is your supplier unbiased in his recommendations?

Your experience in purchasing any kind of equipment tells you that getting a truly unbiased opinion from a company making only one of many types, is rather unlikely. So it is with manufacturers in the infrared field. Many concentrate on one type of radiant oven.

Today, Fostoria is the one firm mak-

Today, Fostoria is the one firm making equipment that accommodates all acceptable sources of radiant heat. No heat sources are made at Fostoria. Consequently, no axe to grind.

Q Will your oven be engineered for your job?

Like a carpenter who attempts to build a boat, even an ordinary sheet metalsmith can build an infrared oven. But one thing is sure, neither boat nor oven will be the fine piece of equipment that gives the satisfaction you want.

Designing and constructing an efficient, economical infrared oven involves (1) selecting the proper heat source, (2) determining correct oven shape, (3) laying out proper interior, (4) applying the right amount of heat, (5) providing suitable controls and accessories. To get the highest effi-

ciency possible at minimum operating costs, all of these factors are considered before Fostoria engineers design the radiant oven best for your needs.

Q Is your supplier soundly established?

Let's face it, all of us have more confidence in the recommendations of a doctor whose shingle is aged with practice—and a bank with substantial assets. So it is similarly reassuring to know you are buying an infrared oven from a company with integrity. One who can, and does, stand back of your purchase 100%

Supplying infrared ovens to thousands of users over the past 20 years, Fostoria is the kind of financially sound, and highly rated corporation you will find it rewarding to deal with.

Q Can you get service after the sale, too?

Whether buying a machine tool, lift truck or radiant oven, often the service you will get is quite as important to consider as the purchase itself. Fostoria established a nationwide network of trained engineers to give top-notch service before and after the sale. That means proper installation—and continuous performance with economy.

Send for a free copy of "Radiant Heat—Applications Unlimited"—our 20-page illustrated booklet on infrared ovens. If you include data on your applications we will gladly include recommenda-

on your applications we will gladly include recommendations in our reply. Write to Department 524

Infrared has many uses in Production Heating today

Save Money—Save Time—Save Space
Dry adhesives
Plastics processing
Thermal degreasing
Food processing
Ink drying
Preheating operations
Shoe drying
Preheating operations
Shoe drying
The Space Space
Soldering
Finishing leather
Shoe drying
The Space Space
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Shoe

THE FOSTORIA PRESSED STEEL CORP.

Largest manufacturer of completely engineered infrared ovens and components in U.S.A.



Sections accommodating clear lamps, quartz lamps, quartz tubes or metal rods



This is the Clearing Torc-Pac 20—an all steel welded O.B.I. with deluxe features normally found in only the more expensive presses. Featuring an enclosed design, this geared press offers a choice of variable speed ranges and a top speed of 225 S.P.M.

AIR FRICTION CLUTCH AND BRAKE

The Torc-Pac 20 has an air-friction clutch and brake—a transmission unique in design and revolutionary in performance. The clutch and brake combination works in oil. It's designed so that normal wear which takes place in a conventional air friction clutch, just doesn't happen in the Torc-Pac. Sound impossible? Why not find out.

Look into the Clearing Torc-Pac 20.

More information is yours for the asking.

Also available in 30 & 45 ton capacities

CLEAR PRESSES



the way to efficient mass production

CLEARING MACHINE CORPORATION division of U.S. INDUSTRIES, INC. 2004
6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

TECHNICAL BRIEFS

The steel pallets are 43-in. wide and 63-in. long; they can accommodate four engines. The units were designed and made by the Pressed Steel Div. of Republic Steel Corp.

Eliminates Dunnage—Before adopting the steel pallets, considerable time was used in shoring up the engines individually with dunnage. This method took ten minutes per engine to load; 3½ to unload. Using the pallets requires only two minutes to load; by unloading with a fork truck, only one-half minute to unload on the platform.

The steel pallets provide for fourway entry. This allows small trucks to lift them from the short side. Made of 9-gage corrugated steel, trucks can stack them three high with a full load.

Flame Cutting

Electronic line tracer pilots flame cutter

A new electronic line tracer for flame - shape cutting machines can significantly reduce costs of pattern preparation for cutting steel. An adaptation of newly developed optical "sensing" systems, it steers metal-cutting torches by scanning or "reading" ordinary pen or pencil line drawings.

According to its developer, the tracer eliminates need for costly templates. The manufacturer, Chemerton Corp., says it reduces the cost of pattern preparation at least 75 pct in comparison to other electronic systems, which require a more complex half-black, half-white area to follow.

Even Crosses Lines — With the new tracer, simple drafting room type pencil drawings no more than 0.04-in, wide are all that are needed for the photo-transistor scanner to follow at speeds as fast as the thickness of metal requires.

The device turns corners on a radius as small as 3/32 in. It will even cross lines. This makes possible cutting of shapes in metal that

could not previously be cut continuously by machine.

Chemetron Corp. is the new name of National Cylinder Gas Co.

Metallurgy

Researchers develop new nickel refining method

Hoping to replace high temperature oxidation and reduction methods are developers of an electrorefining process for nickel. The process employs direct electrolysis of nickel matte, an artificial sulphide. It results in recovery of sulphur and selenium from the nickel.

The result of seven years of study by International Nickel Co.



Casting nickel sulphide anodes, a step in the refining process.

of Canada, Ltd., Toronto, the new method contrasts with usual refining methods in which a metal anode is used. Since it does away with high temperature oxidation and reduction operations, it also eliminates attendant loses of sulphur and selenium metal.

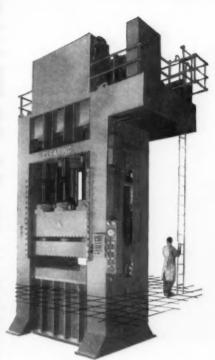
Best Job Yet—Pointing out that the new process is more efficient than the company's present practice, it uses nickel sulphide of low copper content from the Bessemer converter or other source. This can be cast directly into sulphide anodes and electrolyzed for the production of high quality nickel.

The process permits, for the first time in nickel refining, commercial recovery of elemental sulphur and sclenium as valuable by-products.

THIS DOUBLE ACTION Hydraulic

MAKES JOB CHANGING EASIER

Clearing engineers have taken a lot of the struggle out of job changing on this 2,000 ton double action hydraulic press. Push buttons adjust the distance between the main ram and the blankholder. In addition, the blankholder has automatic sliding spacer bars which quickly change the size of the blankholder opening. There are also automatic die lifters which raise the dies off the bolster for fast removal. These are just a few details, of course. We have a lot more facts on this and other hydraulic presses that may be helpful to you. Write or call us.

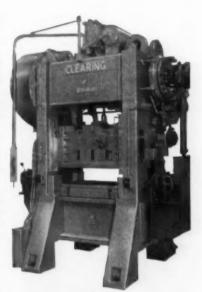


SPEED UP YOUR PRODUCTION WITH A

CLEARING Hi-Speed Press

Here's a speedster that's engineered especially to get the most out of your expensive progressive dies. Special, beefed up frames insure precision in the stampings—less frequent die regrinds and consequently, longer die life. Find out about the presses that can speed up your schedules as well as give your dies maximum protection—the Clearing Hi-Speed Press. Capacities—50 through 200 tons. Speeds to 300 SPM.

Write for descriptive literature.



PERRES S E S



the way to efficient mass production

CLEARING MACHINE CORPORATION division of U.S. INDUSTRIES, INC. @ 6499 W. 65th Street—Chicago 38, Illinois / Hamilton Division, Hamilton, Ohio

New Production Ideas

Equipment, Methods and Services



Motor-driven Grab Allows One-man Coil Handling

Fast, safe, one-man handling of metal coils is possible when the single operator uses this motor-driven grab. The coil grab comes in two styles. One handles single rim-gripping. The other takes care of two coils at the same time. The motor applies the initial grip to eliminate internal coil slippage. A mechanical "wedge-grip" automatically holds the load safely while in midair. This "wedge-grip" is a safety device which prevents the

load from being released in the event of power failure. Gripping pressure is always in proportion to the weight of the load. Both models are driven by a hoist-type motor and a worm-gear reducer. These are totally enclosed. The motor adjusts the grab for handling a wide range of coil rim thicknesses; jaws move in and out on a self-locking Acme screw. (Mansaver Industries, Inc.)

For more data circle No. 39 on postcard, p. 93



Giant Screen Projector Eases Inspection Jobs

Thanks to its giant transparent screen, this exceptionally large optical projector eases and speeds inspection of parts and workpieces. Featuring a huge 60-in. wide and 40-in. high viewing screen, the projector allows checking of parts covering a field of 6 in. at magnification of 10x. Developed in England by Optical Measuring Tools Ltd., the new projection unit primarily is designed for the inspection of contours such as templates,

gears, cam forms, screw threads, etc. However, it could be handy for checking many different type parts, components and workpieces. It could easily adapt to the visual finishing of profile gages while actually imaged on the screen. Virtually any optical projector inspection job can be handled with suitable auxiliary equipment. (Opti Gaging Products, Inc.)

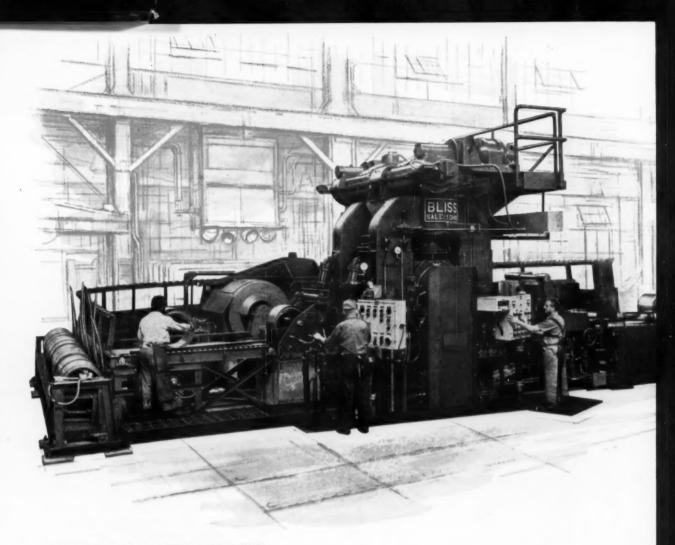
For more data circle No. 40 on postcard, p



Dynamic Machine Balances Jet Components

For dynamically balancing jet engine turbines and compressors to within extremely close limits, a new vertical dynamic balancing machine measures 9 x 6½ x 14 ft high. This rugged machine accommodates jet engine components up to a 55-in. diam maximum, 90-in. long, weighing up to 1000 lb. Parts can be balanced to within 0.0000145-in. displacement at the bearings. Amount and angle of unbalance in both planes of correction are ac-

curately determined by an electrical compensating system. This system eliminates need for machine calibration, thus speeding up the balancing operation. Since the part being balanced has vertical support, even loose fitting blades in turbines or compressor stages do not affect unbalance readings. Readings are reproducible. The machine complies with SAE requirements. (Tinius Olsen Testing Machine Co.)



HOW TO ROLL MORE FOR LESS:

replace three-and-a-half old-timers with one really modern mill

The recently-completed modernization program at H. K. Porter Company's Riverside-Alloy Metal Division has doubled the plant's capacity of specialty non-ferrous alloys with essentially the same work force.

A central unit in the modernization is the Bliss 4-high intermediate mill shown here. According to Riverside, this single new mill provides greater production than the three old mills it replaces—a fourth old mill is still used to some extent, hence the three-and-a-half figure. Equipped with a run-around roller conveyor, the new mill coils metal on the first pass

from ½-inch bars; returns the coils automatically to the entry side for further passes. Former practice was to roll flat for four or five passes before coiling.

Riverside reports that the new equipment will pay for itself in the short space of a few years. It's an outstanding example of the way a well-planned improvement program . . . plus Bliss rolling mill equipment . . . can bring new economy and efficiency to metal rolling. For other examples, write us today for a complimentary copy of our new 84-page Rolling Mill Brochure.



Bliss is more than a name...it's a guarantee

E.W. BLISS COMPANY, Rolling Mill Division, Salem, Ohio Subsidiary: The Matteson Equipment Company, Inc., Poland, Ohio



Air-run Feeder Handles Broad Range of Parts

Compact and automatic, this combination parts feeder and escapement unit handles a broad range of small parts. Available either fully tooled or untooled, the unit includes a feeder, feed rack, escapement mechanism, and a new twin-rail mounting column. Compactness and simplicity are major features of the setup. And these mean easy application and installation. Maximum over-all width is only 6 in., which conserves space

and permits close nesting of multiple units. Controlling and feeding of parts is by a single dual-purpose air cylinder. This connects on one end to a positive-acting escapement mechanism; on the other, it fits onto a feeder drum operating arm. The feeder housing has 180 cu in. capacity for piece-parts when filled to a proper level. (Dixon Automatic Tool, Inc.)

For more data circle No. 42 on postcard, p. 93



Forged Valves Resist Heat, Pressure, Corrosion

Precision built, this forged steel globe valve overcomes many problems of ever-increasing temperatures, pressures and corrosion. Such valves insure long and trouble-free service life. Its forged steel body, bonnet and two piece gland provide high strength and a very high factor of safety. Flexitallic gaskets, generally reuseable, afford a positive and tight seal for the bolted bonnet. The valve's stainless steel stem is centerless ground to a 6 to 8 micro finish in order to insure long pack-

ing life. For high strength, it has a hardness of 375 Brinell (Rockwell C40). The unit's 2 to 4 micro finish disc-lapped seat face, of stainless steel, has a hardness of 500 Brinell (Rockwell C50) for excellent controlled operation in high pressure, high temperature service. Moulded asbestos packing, which is mica lubricated and wire reinforced, reduces stem corrosion and electrolytic action. (American Chain & Cable Co., Inc.)

For more data circle No. 43 on postcard, p. 93



Relatively Small Benders Tackle Big Work

Big machine bending efficiency with smaller machine space occupation is this machine's boast. It's one unit of an entirely new line of tangent bending machines. This new equipment is a result of market analysis indicating a need for a relatively small type of machine to do tangent bending on product sizes that require heavy hydraulic units. This is the smallest bender of the line. It's an open end, single wing, tangent bender particularly designed for narrow products, less

than 6-in. wide. These include items such as tubing, angles, channels. It requires no front clamping mechanism and has a rapid operation cycle. Loading convenience for the operator is a key feature. Other air operated machines in this new line of equipment include conventional single-wing, duplex and quadruplex tangent benders. These handle material from 24 to 48-in. wide. (Taylor-Winfield Corp.)

For more data circle No. 44 on postcard, p. 93



Locking Plug Prevents Misuse and Accidents

Handy for use in plants where dangerous electrical equipment may be accessible to unauthorized personnel is a new lock plug. It has a key-operated nylon safety bar. This, in its locked, projecting position, prevents the entrance of the plug into an electrical outlet. (Yale & Towne Mfg. Co.)

For more data circle No. 45 on postcard, p. 93



WITH WEIRKOTE YOU CAN SAY GOODBYE TO PLATING!

The problem: Regardless of the current used in plating, it was economically impractical to throw the plating solution beyond ¾ of the depth of the parts shown above. The parts were thus only partially plated making them extremely vulnerable to corrosion.

The answer: The manufacturer of these parts switched to Weirkote zinc-coated steel! Weirkote can eliminate plating, provide excellent corrosion resistance before, during and after production and, as you can well understand, lower costs, too.

You can work Weirkote to the very limits of the steel itself—no flaking, no peeling, no dipping after fabrication. Weirkote's continuous process integrates the zinc and the steel to wage a winning war against corrosion during the life expectancy of your products.

Can you use Weirkote's many advantages in your product and production? Write for free brochure that will spell out the answers to many of your questions. Weirton Steel Company, Dept. A-18, Weirton, West Virginia.



WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

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AND COSTS
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Long, active experience with all tube forming processes and high standards of quality control make sure your orders will be completed right.

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It's routine for formed tubes parts to deliver top performance, save weight, cut costs. Steel, copper, brass, aluminum or stainless tubing fabricated in 3/4" OD to 6" OD sizes; from 20 to 11 ga. metal.

Formed Tubes, Inc. 506 Prairie, Sturgis, Michigan

Write for FREE Booklet



NEW EQUIPMENT

Welding Guard

Applied to metal adjacent to surfaces to be welded, a compound prevents adhesion of weld spatter to the surrounding metal surface. The viscous amber liquid is nontoxic, non-inflammable and noncorrosive to both ferrous and nonferrous metals. Once applied, it forms a tough barrier which prevents molten weld spatter from adhering. (Clarkson Laboratories, Inc.)

For more data circle No. 46 on postcard, p. 93

Emergency Stopper

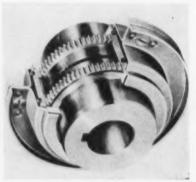
An emergency stopper closing unit recently introduced is now optional equipment on one maker's ingot teeming device. This device makes it possible to teem ingots from a safe, remote location. The standard unit, minus the new optional equipment, employs hydraulic power to actuate the stopper. Should electrical service fail the operator must close the stopper by hand with considerable exertion and danger. The new unit automatically stores a reserve of hydraulic power. This is sufficient to close a stopper, terminating the pour, at any time after a power failure has occurred. (Blaw-Knox Co.) For more data circle No. 47 on postcard, p. 93

Bronze Alloy

Corrosion-resistant, a new nickelsilicon bronze alloy combines both high yield strength and high ultimate tensile strength even at elevated temperatures. The alloy is age hardenable. It's available in soft, cold forming, and hard tempers. Age hardening of the alloy is a rapid, inexpensive treatment at 900°F for 90 minutes. The cold forming temper permits easy material flow for fabrication involving severe or complicated cold working. Susequent age hardening gives final high strength, hardness and conductivity to the nickel-siliconbronze alloy. It will not age-harden spontaneously at storage temperatures. The hard temper can be machined or given moderate cold working without further treatment. (Chase Brass & Copper Co.)
For more data circle No. 48 on postcard, p. 93

Flexible Coupling

This geared flexible coupling fits shaft diameters up to 1%-in. Designed especially for use as a motor coupling, it can serve transmission of electric motor power to pumps, generators, speed reducers, etc.



Basic principles of operation are like those of a conventional geared coupling. Externally geared hubs are mounted on the shafts and joined flexibly by an internally geared sleeve. Power transmitting parts are steel and fully machined. (Link-Belt Co.)

For more data circle No. 49 on postcard, p. 93

High Production Press

Though operating at high speed, this press maintains a 75-fpm draw speed. An enclosed straight side double action unit, the press comes in 300 to 1600-ton capacities. JIC sizes start from 72 x 48 in. Featuring two or four point suspension on the inner ram, the models are eccentric gear driven throughout all sizes. A variety of press drives is available, including the quill type "K" combination clutch and brake and the newest modified type "F" clutch and brake, with two-speed operation. With type "F" high production rates are possible through quick approach, slow draw and quick return of both rams. Slow inch drives are available on



Assignment: Experimental and maintenance schoolwork at Rice Institute—Ray Martin, machinist at Rice Institute, Houston, can tell you about the constant variety of both experimental and maintenance work he turns out on their Kearney & Trecker—Milwaukee Model CH 5hp No. 2 universal mill. On this job, Ray slab mills a 2" x ¼" cut on an experimental piece with a 4" HSS cutter at 1% ipm feed, 58 rpm. Broad machine working surface and range of speeds and feeds meet all standard and special jobs remarkably well.

KEARNEY & TRECKER

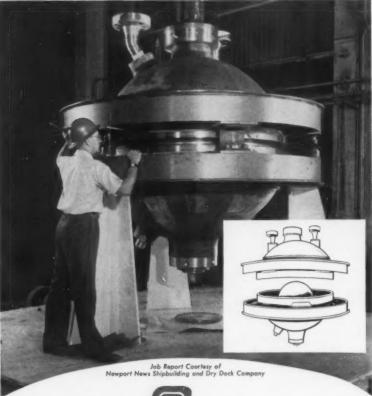
6792 W. NATIONAL AVE., MILWAUKEE 14, WIS.

Kearney & Trecker staff photo by Ron Johnson

Kearney & Trecker's man on the job . . .

Allen Diener of Steel & Machine Tool Sales Co., Houston, supplied the information used in selecting this machine. For expert milling counsel, call the K&T man near you. And remember to ask him, or write direct, for free comprehensive catalog.

NEW WELDING PROCESS used to fabricate reactor test vessel



the FIRCOS



To simplify and speed joining the halves of this pressure vessel shell, and insure corrosion resistant root passes, a preplaced Arcos Consumable Insert was used. With this method, only outside welding was required to produce sound welds with uniform contours on the inaccessible inside surface. The welds readily passed Radiograph inspection for freedom from porosity, slag and other inclusions. The EB Weld Insert can save you time and money. Write for details. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.



NEW EQUIPMENT

either type pneumatic clutch. These presses may also make use of a new electronic press drive. This drive permits reverse jogging of a press without stopping and revers-

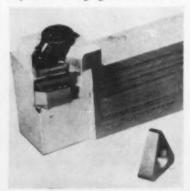


ing the motor, which saves time with die changes. In addition, a servo system controls clutching and braking, electronically compensating for heat and pressure variations. (E. W. Bliss Co.)

For more data circle No. 50 on postcard, p. 93

Carbide-tool Holder

This throwaway insert type toolholder features variable geometry. It permits changing of rake and re-



lief angles of carbide cutting tools without removal of the toolholder. It could reduce toolholder inventory for job-lot shops that have an infinite variety of job requirements. Toolholders come in two shank

sizes: 1¼ x 1 in. and ¾ x ½ in., and six styles. (United Tool Co.) For more data circle No. 51 on postcard, p. 93

Aluminum Conductor

All aluminum alloy conductor is being made available for general commercial use. Designed for overhead distribution systems, the material has strength and electrical properties of aluminum conductor steel reinforced, its maker says. It costs the same on a footage basis and yet offers many installation, upkeep, performance and economic advantages. (Kaiser Aluminum & Chemical Sales, Inc.)

For more data circle No. 52 on postcard, p. 93

Plating-agent Unit

A new dispenser adds and meters addition agents to plating baths. Mounted at any spot on the reinforcing angle rim of a plating tank, it can be supported from any suitable position over the tanks by a hook. Or it may be remotely mounted with extra long tubing. The dispenser is a 2-gal polyethylene container supported by a plastisol coated ring stand. (Wagner Bros., Inc.)

For more data circle No. 53 on postcard, p. 93

Wire Rope

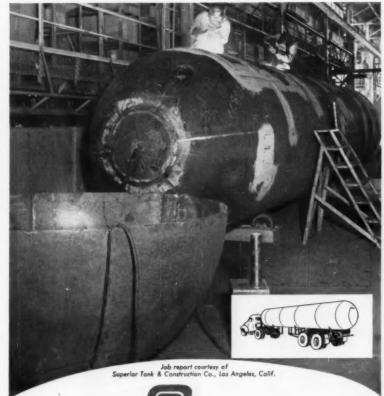
Herringbone wire rope combines flexibility and abrasion-resistance of Lang lay rope with structural stability of regular lay. Wires in regular lay rope are laid in a direction opposite to that of the strands in the finished rope. Wires in Lang lay rope follow the same direction as the finished strands. Herringbone rope is fabricated of two pairs of Lang lay strands separated by two strands of regular lay. (John A. Roebling's Sons Corp.)

For more data circle No. 54 on postcard, p. 93

High-speed Welder

Automatic high-speed welding equipment recently developed arcwelds steel at speeds ranging up to 300 ipm. Using a new type flux-

How X-Ray Quality Welds Make Low Alloy Steels Pay Off

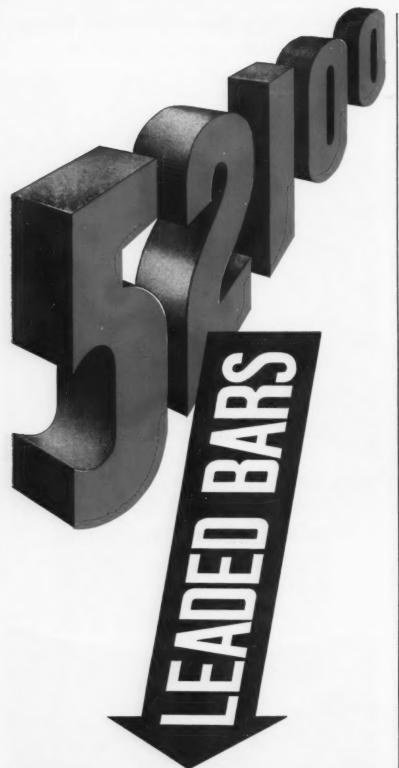


WELD WITH THROOS &

LOW HYDROGEN ELECTRODES

The vessel being welded is part of an L.P.G. tank truck. For high strength with low weight—USS "T-I" steel is used and welded with Arcos Ductilend IIO Electrodes. These tanks meet or exceed ASME code requirements... and all Ductilend IIO welds qualify with X-ray soundness. Ductilend IIO is an Arcos Low Hydrogen Electrode especially developed for welding high strength notch tough steels of the IIO,000 psi tensile strength range. Data sheet on request. ARCOS CORPORATION • ISOO South 50th Street, Philadelphia 43, Pa.





PETERSON STEELS, INC.

Union, New Jersey • Detroit, Michigan • Chicago, Illinois

NEW EQUIPMENT

containing, coiled wire electrode, it produces a vapor shielding for an open arc. This contrasts to the completely flux-covered arc of submerged arc welding and the open arc gaseous shielding of coated manual electrodes. No fluxing or shielding agents are added to the arc from external sources. All materials are integrally contained in the electrode. (The Lincoln Electric Co.)

For more data circle No. 55 on postcard, p. 93

Cage-type Bearing

With this cage-type bearing, a manufacturer offers a needle roller bearing interchangeable dimensionally with heavy duty needle models. The retainer-equipped bearing provides adequate capacity where excess misalignment prohibits using



greater inherent capacity of full complement bearings. Constructed in two standard stock sizes, it's available with or without separable inner races. A one-piece, channeled outer race contains a single row of rollers in a continuous steel cage. (McGill Mfg. Co., Inc.)

For more data circle No. 56 on postcard, p. 93

Welding Gun

This metal-arc inert gas tool performs short-length welding in hard-to-get-at places. Drive rolls and wire supply are contained in the gun. Wire feed speed is up to 900 ipm. The gun handles 0.030, 0.035, 3/64 and 1/16-in. aluminum and 0.030, 0.035, 0.045-in. hard wires. Typical applications in-



NOW...tube-type MOTORS with capsule-mounted split-sleeve bearings

Now the most effective air cooling system ever designed for larger TEFC motors has been combined with the accessibility of capsule-mounted split-sleeve bearings. *Both* of these user benefits are available in a newly designed line of Allis-Chalmers tube-type motors.

Indoors or outdoors, these Allis-Chalmers motors are ideal for moist, corrosive and hazardous atmospheres. Contact your A-C district office, or write Allis-Chalmers, General Products Division, Milwaukee 1, Wisconsin.



Cooling system works like this: Air circulated within the motor by internal fans transfers motor heat to a nest of tubes around the stator. External fans constantly blow cool air through the tubes to absorb and remove heat.



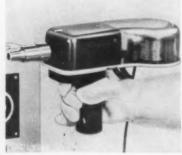
ALLIS-CHALMERS

Capsule mountings permit access to bearings without exposing vital electrical parts. This design is available for directly coupled drives; ball or roller bearings also available.



NEW EQUIPMENT

clude: extruded aluminum shapes, highway signs, aluminum furniture, radar screens and antenna, and brackets and pads attached to ship super-structures. Cabinet is 11 wide, 12 long and 4-in. deep. It



weighs 17 lb. The gun measures 14½-in. from front to rear, 7½-in. high and 5¼-in. at the widest part. Without wire supply, gun weighs about 3-lb. Welding power source must be a direct-current machine. (Air Reduction Sales Co.)

For more data circle No. 57 on postcard, p. 93

Electrolytic Markers

High-speed automated electrolytic marking on metal parts is performed by a new portable 70-lb unit. It incorporates both an electrolytic marking power source and control circuits. The latter govern stroke and dwell of the motor-operated marker ram. Depending on open stencil area and type of metal, the unit marks in as little as 1.5 seconds. Two mark types are possible: etched (metal removed) and oxidized (color changed). (The Lectroetch Co.)

For more data circle No. 58 on postcard, p. 93

Inclinable Presses

New open back inclinable presses embody many unusual design features. They contain an air-friction clutch and brake as standard equipment. The clutch and brake plates are of long wearing, sintered bronze. They operate in an oil bath at all times. The oil bath serves an important function in addition to lubrication. Upon engagement, oil is momentarily "trapped" between the plates. The oil molecules are crowded to a point where the oil itself begins to transmit the pick up load. Much of the pick up is accomplished before a metal-to-metal contact of



the plates take place. In this way a good deal of the wear that some friction linings are subject to never takes place. The clutch and brake never require adjustment and can be expected to operate for millions of engagements without maintenance. (Clearing Machine Corp.)

For more data circle No. 59 on postcard, p. 93

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FUNCTIONAL



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You can order attractive Hendrick Perforated Screens in many designs, sizes and shapes, with either plain or panel effects. These screens are made in commercially rolled metals and gauges...or in masonite, rubber, plastic, or insulated board. They are always made to your specifications...by the Pioneer of Perforated Metals, and backed by years of experience and modern manufacturing facilities.

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NEW BOOKS

"Toward the Factory of the Future" takes a peek at tomorrow's plants. And the look is a real one; actual company plans are looked into. 96 pp. \$2.50. American Management Assn., 1515 Broadway, New York 36.

"Plant Engineering Practice" covers every major area of plant operation and maintenance. It contains 13 extensive sections on: sites & layout, construction, housekeeping & safety, materials handling, maintenance, paints & protective coatings, mechanical power & piping systems, electric power, lighting, utilities, heating, ventilating &

air conditioning, instrumentation & quality control. Prepared by the editor's of "Plant Engineering" it's co-publisher is Technical Publishing Co. 694 pp. 9 x 12 size. \$18.50 per copy. F. W. Dodge Corp., 119 W. 40th St., New York 18.

"New Techniques in Marketing Management" stresses this line: No longer do sales belong to the sales department. Every branch of your firm must concentrate on a better product, better service, better customer relations. Basically aimed at marketing to consumers, the book contains little to help those selling to non-emotional industrial purchasing agents. 246 pp. \$7.50 per copy. Prentice-Hall, Inc., 70 Fifth Ave., New York 11.

"Metallurgical Aspects of The Control of Quality in Non-Ferrous Castings" is based on a 1957 symposium held in London. It contains several technical articles on quality control of aluminum, copper, magnesium, nickel and related alloy castings. 148 pp. The Institute of Metals, 17 Belgrave Sq., London, S.W.1, England.

"Accounting Guide for Defense Contracts" could be very helpful to readers who: (1) are concerned with defense contracts; (2) understand accounting. 464 pp. \$12.50 per copy. Commerce Clearing House, Inc., 214 N. Michigan Ave., Chicago 1, Ill.

"Steel Pipe Flanges & Flanged Fittings" gives new American standards on 150, 300, 400, 600, 900, 1500 and 2500-lb components. It includes requirements for flanged end and butt-welding end valves. 76 pp. ASA B16.5-1957. \$3 per copy. American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

"Petroleum Products & Lubricants" gives ASTM standards and related information on these materials. It includes test methods, specifications, definitions, and charts and tables. Issued annually, this is the most up-to-date (Nov. 1957) edition available. 1108 pp. \$8 per copy. (members: \$6). American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa.

"Estimating Machine Costs" is a guide for estimators of machinetool operation costs. Basically, its methods work like this: An estimator looks at an engineering drawing; a little study and he can pretty well guess how much men, time, machinery and material will be needed for the job. Of course, it's not quite that simple. The book explains why. 400 pp. \$8 per copy. McGraw Hill Book Co., 327 W. 41st St., New York 36.

"An Approach to the Theory of Income Distribution" by Sidney Weintraub analyzes employment and income theories. A recognized economic authority, Dr. Weintraub is now Prof. of Economics at University of Pennsylvania. In stormy economic times like now, many executives and business analyists

NEW BOOKS

might want to wade through the professor's macroeconomic theory analysis. But it's heavy text and numerous formulas seem to encourage reading by only economists and businessmen with plenty of time on their hands. 214 pp. \$6.50 per copy. Chilton Co., Book Div., 56th & Chestnut Sts., Philadelphia 39,



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The Iron Age Summary

Detroit Has Steel Stock Jitters

The carmakers are sounding out steel mills on prospects for quick deliveries.

Behind nervousness is possibility of earlier-than-expected new model output.

■ The auto industry has a bad case of steel inventory jitters. Some top automotive steel buyers have sounded out the mills on the prospects for quick delivery should they need steel in a hurry. Tied in with this anxiety is the possibility of early introduction of new car models as a move to step up sales.

Apparently this means the automakers are keeping 1959 production plans flexible, tuned to new car inventories, and just how fast the inventories are being reduced. If the inventory reduction of new cars gathers speed, there is a good chance Detroit will bring its new models out early.

Behind the Jitters—Here's why the carbuilders are on edge: Suppose the automakers phase out production of current models early—June, or perhaps early July. A continued drop in new car stocks between now and then could conceivably result in a shortage of cars. To avoid this, the car manufacturers would want to bring out new models earlier. Thus the concern over chances for quick steel deliveries in volume.

Rumors making the rounds in Detroit are that one medium-price car builder may end current production about the third week in June, or possibly about end of May. Another builder is said to be considering a start on two of its cars about mid-August, one month earlier than originally scheduled.

On Thin Ice—Steel inventories at some auto plants are so low that almost any production increase would put them in a bind. Steel sources in the auto capital say that raw material buyers at one auto company have told their top management they will be in trouble if they have only a five per cent boost in car output.

Meanwhile, the overall steel market picture shows a slight improvement in some areas. Hot-rolled bars, welded pipe, and galvanized sheets have picked up somewhat. Plate and structural orders have also gained slightly. This is probably due to seasonal influences, notably a betterment in construction and homebuilding.

Up, Down, Up—Steel leaders are still banking on a steady improvement in their market in May and June. But they feel the second quarter will wind up no better than the first three months from a production standpoint.

One industry leader looks for the second quarter pattern to be repeated in the third. July will be down, August will show an improvement as automotive buying takes hold, and a still further improvement in September.

This source feels that steel ingot production in the first three quarters of 1958 will be about 60 million tons. He looks for a steady strengthening in fourth quarter.

Steel Output, Operating Rates

Prod Net tons, 000	uction omitted)	This Week 1,400	Lost Week 1,334	Month Ago 1,285	Year Ago 2,164	
Ingot	Index					
(1947-194	9=100)	87.2	83.0	80.0	134.6	
Operating	Rates					
	Chicago	58.0	55.0*	54.0	82.0	
	ttsburgh	53.0	49.0*	49.0	90.0	
	delphia	56.0	55.0	54.0	101.0	
	Valley	37.5	37.0*	34.0	79.0	
	West	74.0	70.0*	68.0	101.0	
C	leveland	26.0	27.0*	25.5	81.5	
	Buffalo	39.0	34.5	39.0	85.5	
	Detroit	38.0	34.0*	12.0	85.0	
	South	67.0	65.0	54.5	94.0	
South Oh	io River	52.0	28.0*	48.0	77.0	
Upper Oh	io River	72.5	70.0*	64.0	85.0	
	it. Louis	77.0	82.0*	55.0	85.0	
N	ortheast	31.0	31.0	31.0	66.5	
Aggi	regate		49.4	47.6	84.5	

*Revised

Prices At a Glance

(cents per lb unless otherwise	noted)			
	This	Week	Month	Year
	Week	Ago	Ago	Ago
Composite price				
Finished Steel, base	5.967	5.967	5.967	5.670
Pig Iron (Gross ton)	\$66.49	\$66.49	\$66.49	\$66.56
Scrap, No. 1 hvy				
(Gross Ton)	\$32.67	\$32.00	\$32.83	\$45.83
No. 2 bundles	\$23.83	\$23.17	\$24.17	\$38.17
Nonferrous				
Aluminum ingot	26.10	26.10	26.10	27.10
Copper, electrolytic	25.00	25.00	25.00	32.00
Lead, St. Louis	11.80	11.80	11.80	15.30
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	94.75	94.25*	92.25	97.62
Zinc, E. St. Louis	10.00	10.00	10.00	11.50

Toolmakers Fight Market Slump

Makers of hammers, files, and wrenches introduce many new or improved products to stimulate sales.

Despite recession they are confident about market outlook for rest of '58.

■ Choosing the best tool for a specific job in today's abundant market can be a time-consuming job for a purchasing agent. A flood of new and improved hand tools are pouring out of toolmakers' plants.

It's almost an impossible task to consider all the products on the market if you are under normal pressure. Here are just a few of the newer tools out: Hammers and Files—A line of soft-faced, plastic-tipped hammers that outlast lead hammers by 100 to 1 and rawhide by 50 to 1. These hammers have interchangeable tips made of a tough plastic that resists flaking, will not pick up chips, support combustion, spark, or mushroom. They come in a variety of tip shapes and hardnesses.

At least two major file makers are introducing new files designed to make fast, deep penetration on most metals, yet leave a smooth finish. Improved tooth design and narrow chip breakers are aimed at speeding up filing production.

Wrench Set Combinations— Wrench manufacturers are busy, not only with new products, but finding the best combination of flat and socket wrenches to offer in sets. To answer steadily increasing demand for \(^3\epsilon\)-in. drive sockets and handles, one firm has come up with a 20-piece set consisting of seven standard sockets, sizes \(^3\epsilon\)-in.; eight deep sockets, sizes \(^3\epsilon\)-in. to \(^3\epsilon\)-in.; and a 2-and-\(^5\epsilon\)-in. extension with flex handle, cross bar, and reversible rachet.

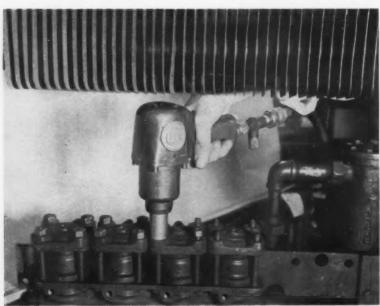
Another wrench maker has announced a large model geared head wrench that has a rated capacity of 4000-ft lb, utilizes a 1-in. input drive and 1½-in. output drive.

Tool Suppliers Optimistic— Combination tube benders which bend both hard and soft tubing and handle from two to seven sizes are one of the newest items in this field.

Despite the recession, most producers of hand tools are optimistic regarding the outlook for the remainder of 1958. A few anticipate "minor price adjustments," but most expect to hold the price line this year. Among the companies reporting, delivery promises varied from "at once" to 10 days. None reported any shortage of materials.

Sales Hold Steady—"Our sales are presently increasing and we expect 1958 to be a better year than 1957," reports The Sherman-Klove Co., a Chicago wrench manufacturer. "There are many factors involved in this forecast, not the least of which are reports from the Service Tools Institute indicating the tool industry is holding its own in the current recession."

Another Midwestern firm says its sales are holding steady at present but that it expects "overall tool sales in 1958 to run about 3 pct under 1957."



PRODUCTION MAN'S HELPER: Air-driven hand tools, like this Chicago Pneumatic Tool Co. nutrunner, have found a permanent place in production and plant maintenance work. This model features an adjustable clutch, speed regulator, close torque control, and quick reverse.

Thousands of rivets or blanks for cold headed Brainard Specials are produced in only minutes (3½ million pieces daily) on this battery of modern cold headers from Youngstown Rivet Quality Wire.



Accent on excellence Youngstown solid rivet wire



BRAINARD RIVERS - GLEVIS PINS - SPECIALS

Brainard Rivet Company of Girard, Ohio, daily produces rivets "by the millions". But they realize a rivet is only a rivet—so quality and fast, dependable service are the products they're really selling.

To help in maintaining Brainard's high product quality on a steady, dependable production basis is Youngstown's Solid Rivet Quality Wire. It is free of all injurious seams and inclusions which guarantees long, trouble-free production runs on Brainard's cold headers.

Wherever steel becomes a part of things you make, the high standards of Youngstown quality, the personal touch in Youngstown service will help you create products with an "accent on excellence".



THE

YOUNGSTOWN

SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

Why Sheet Mills Are More Optimistic

Amid the tough fight for orders, sheet salesmen are finding cause for cheer.

Hedge buying will help June order books. And, after July dip, steady improvement should continue into fall.

■ The sheet market is still in the doldrums. Mill operations remain at depressed levels. Large tonnage orders from the automakers have dried up until at least mid-summer. Salesmen are exerting every effort to uncover orders. Distant mills are absorbing up to \$10 in freight costs competing with suppliers closer to the customer.

Yet, despite all this, there's an undercurrent of optimism in the market. It's supported by an increasing number of encouraging reports. Even with the lack of ordering by Detroit the overall volume of sheet business is holding steady. Mill order books for June are fattening as customers line up tonnages to beat any steel price increases. Warehouses are doing a little more buying to fill in depleted stocks. And in the Farwest producer backlogs are again beginning to build up.

Brighter Days Coming—It's now possible to trace sheet's probable pace through the second and third quarters. This, too, lends comfort to sales and mill personnel.

May shipments should at least equal April's for most mills. Thanks largely to hedge buying June will be better. There'll be a dip again in July. But automotive sheet buying for the '59 models will bolster the market in August. That improve-

ment should continue in September.

All in all, the road ahead for sheet producers looks less bumpy than the ground covered in the last six months.

Plates and Shapes—May shipments of plates and structurals should top levels of March and April by a good margin. An Eastern producer says May plate orders are already 15 pct over April bookings. User inventories of heavy steel at Pittsburgh are still high but have been cut sharply since the start of the year. Mills there believe buyer stock adjustments in plates and shapes will end sooner than inventory corrections in other steel products.

Structurals continue showing slow, steady gains in the Midwest. Plate users, however, are still dumping tonnages back into the market. On the West Coast, mill backlogs of structurals have stopped shrinking.

Bar—Hot-rolled bar is making small gains, but cold finished still lags. Order intake on hot-rolled bar increased at Midwest mills at beginning of the month. Producers there expect improvement in sales through rest of May with an even

PURCHASING AGENT'S CHECKLIST

Tool and die upturn points to gradual business pickup. P. 31

Swing to packaged industrial equipment continues. P. 36

Seaton plan for metals subsidy faces tough fight. P. 53

better June. Forgers, farm equipment makers, and appliance manufacturers are buying more actively. Warehouse and automotive customers are doing little ordering.

Pipe and Tubing—Buttweld and electricweld pipe sales are moving up. Customers are buying for May delivery and lining up June tonnages to beat any price increases. Some users have moved their entire July orders back to June. Jobbers are now carrying balanced stocks of buttweld and buying regularly to stay even with demand.

Scamless pipe mills continue at about 50 pct of capacity as oil industry users go on chewing up inventories. Lack of any pick-up in the level of oil drilling activity is hampering the market.

Large diameter welded pipe is regaining some of the life it lost because of the Memphis case. A few sizeable orders for linepipe have been placed recently. At the same time mills point out that, so far, no lipepipe tonnages have been cancelled outright. In addition several gas transmission companies are making agreements with utility customers on rates. They are getting government approval because the rate schedules are uncontested. Therefore some transmission projects using linepipe will probably open up even though the Memphis case won't be reviewed by the Supreme Court until fall.

Wire Products—Improved sales have boosted production from about 40 to 60 pct of mill capacity in the last few weeks. However, most orders are still on an immediate shipment basis. Salesmen are warning customers a stampede to fill inventories could quickly extend delivery dates, catching buyers short. Some price hedge buying is expected to help June tonnages.

Merchant wire sales are better as farmers increase fencing purchases. Manufacturers wire is slower with automotive users quiet. But, upholstery wire orders from furniture makers are helping the market.

COMPARISON OF PRICES

(Effective May 13, 1958)

Finished Steel Composite: (per po				
Wire Rods and Skelp: (per pound Wire rods	6.15¢ 4.875	6.15¢ 4.875	6.15¢ 4.875	5.80¢ 4.225
itito, process, princes, come	114.00	114.00	114.00	107.00
Forging billets	96.00	96.00	96.00	
Slabs, rerolling	77.50			91.50
	\$77.50	77.50	77.50	74.00
Semifinished Steel: (per net ton)	*** **	277.50	\$77.50	\$74.00
Light rails	6.50	6.50	6.50	6.25
Heavy rails	\$5.525	\$5.525	\$5.525	\$5.278
Rails: (per 100 lb.)				
Bright wire	7.65¢	7.65¢	1.404	1.204
Wire: (per pound)	2 42 4	2 454	7.65¢	7.204
Wrought iron bars	14.45	14.45	14.45	11.50
Stainless bars (No. 302)	45.00	45.00	45.00	48.25
Structural shapes	5.275	5.275	5.275	5.00
Alloy bars	6.475	6.475	6.475	6.12
Cold finished bars	7.30	7.30	7.80	6.85
Merchant bar	5.425¢	5.425¢	5.425¢	5.074
Bars and Shapes: (per pound)				
opecial conten mig. termes	3.00	0.00	0.00	0.00
Special coated mfg. ternes	9.55	9.65	9.55	9.55
Tin plates, electro (0.50 lb.)	9.00	9.60	9.00	9.00
	\$10.30	\$10.30	\$10.30	\$10.30
Tin and Terneplate: (per base bo	w)			
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	00.00
Plates, wrought iron			52.00	50.00
Plate	13.15	13.15	13.15	10.40
	5.12	5.12	5.12	4.87
Cold-rolled strip	7.17	7.17	7.17	6.87
Galvanized sheets (10 ga.) Hot-rolled strip	4.925	4.925	4.925	4.67
	6.60	6.60	6.60	6.30
Cold-rolled sheets	6.05	6.05	6.05	5.75
Hot-rolled sheets	4.925€	4.925∉	4.925∉	4.678
Flat-Rolled Steel: (per pound)	1399	1350	7399	750
	1958	1958	1958	1957
declines appear in Italica.	May 13	May 6	Apr. 15	May I
declines appear in Italics.	Mecw Wi	e printed	III Alem	3 -28
Price advances over previous	week an	e printed	in Heav	v Type
of major producing areas: Pit				

Finished St	cel Composite
plates, wire	index based on steel bars, shapes, e, rails, black pipe, hot and cold s and strips.

Pig Iron Composite

Based on averages for basic iron at Valley
furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	May 13 1958	May 6 1958	April 15 1958	May 14 1957
Pig Iron: (per gross ton)				
Foundry, del'd Phila	370.97	\$70.97	\$70.97	368.88
Foundry, Valley		66.50	66.50	65.00
Foundry, Southern Cin'ti		73.87	73.87	67.17
Foundry, Birmingham		62,50	62.50	59.00
Foundry, Chicago		66.50	66.50	65.00
Basic, del'd Philadelphia		70.47	70.47	68.38
Dasic, dei d Filladeiphia		66.00	66.00	64.50
Basic, Valley furnace		66.50	66.50	65.00
Malleable, Chicago		66.50	66.50	65.00
Malleable, Valley	66.50	96.00	00.00	00.00
Ferromanganese 74-76 pct Mn,			10.00	12.75
cents per lb!	12.25	12.25	12.25	12.75
ig Iron Composite: (per gross t		*** ***	200 40	\$64.56
Pig iron	866.49	\$66.49	\$66.49	\$04.00
crap: (per gross ton)				
No. 1 steel, Pittsburgh	\$33.50	\$32.50	\$32.50	\$46.50
No. 1 steel, Phila. area	84.00	34.00	36.50	49.50
No. 1 steel, Chicago		29.50	29.50	41.50
No. 1 bundles, Detroit		21.50	21.50	39.00
Low whos Voungatown		34.00	32.50	45.50
Low phos., Youngstown No. 1 mach'y cast, Pittsburgh.	48.50	48.50	49.50	53.50
No. 1 mach'y cast, Phila	47.50	47.50	47.50	55,50
No. 1 mach'y cast, Chicago	43.50	42.50	43.50	45.50
iteel Scrap Composite: (per grown No. 1 hvy. melting scrap No. 2 bundles	\$32.67	\$32.00 23.17	\$32.83 24.17	\$45.83 38.17
oke Connellaville: (per net ton	at oven	\$15.39	\$15.29	\$15.38
oke Connellaville: (per net ton Furnace coke, prompt Foundry coke, prompt\$17.50	\$15.38	\$15.38	\$15.38 7.50-\$19 \$1	\$15.38 7.50-\$19
Furnace coke, prompt\$17.50	\$15.38)-\$19 \$17.	\$15.38 50-\$19 \$17	7.50-\$19 \$1	7.50-819
Furnace coke, prompt	\$15.38 0-\$19 \$17. ound to l	\$15.38 50-\$19 \$17	7.50-\$19 \$1	7.50-\$19 \$2.00
Furnace coke, prompt	\$15.38 -\$19 \$17. ound to 1 25.00 25.00	\$15.38 50-\$19 \$17 arge buye	7.50-\$19 \$1 25.00 25.00	7.50-819
Furnace coke, prompt	\$15.38 -\$19 \$17. ound to 1 25.00 25.00	\$15.38 50-\$19 \$17 arge buye 25.00	7.50-\$19 \$1 25.00 25.00	7.50-\$19 \$2.00 \$2.00
Furnace coke, prompt	\$15.38 -\$19 \$17. ound to 1 25.00 25.00	\$15.38 50-\$19 \$17 arge buye 25.00 25.00 94.25*	7.50-\$19 \$1 (rs) 25.00 25.00 92.25	7.50-\$19 \$2.00 \$2.00
Furnace coke, prompt \$17.50 fonferrous Metals: (cents per pc Copper, electrolytic, Conn Copper, Lake, Conn. Tin, Straits, N. Y. Zine, East St. Louis	\$15.38 \$19 \$17. ound to 1 25.00 25.00 94.75† 10.00	\$15.38 50-\$19 \$17 arge buye 25.00 25.00 94.25* 10.00	7.50-\$19 \$1 25.00 25.00 92.25 10.00	32.00 32.00 97.625 11.50
Furnace coke, prompt Foundry coke, prompt . \$17.5(onferrous Metals: (cents per pi Copper, electrolytic, Conn. Copper, Lake, Conn. Tin, Straits, N. Y. Zinc, East St. Louis Lead, St. Louis	\$15.38 \$19 \$17. ound to 1 25.00 25.00 94.75† 10.00 11.80	\$15.38 50-\$19 \$17 arge buye 25.00 25.00 94.25* 10.00 11.80	7.50-\$19 \$1 25.00 25.00 92.25 10.00 11.80	32.00 32.00 97.625 11.50 15.30
Furnace coke, prompt . \$17.50 ionferrous Metals: (cents per p. Copper, electrolytic, Conn Copper, Lake, Conn	\$15.38 0-\$19 \$17. ound to 1 25.00 25.00 94.75† 10.00 11.80 26.16	\$15.38 50-\$19 \$17 arge buye 25.00 25.00 94.25* 10.00 11.80 26.10	7.50-\$19 \$1 25.00 25.00 92.25 10.00 11.80 26.10	32.00 32.00 97.625 11.50 15.30 27.10
Furnace coke, prompt Foundry coke, prompt Sinferous Metals: (cents per pi Copper, Lake, Conn. Tin, Straita, N. Y. Zinc, East St. Louis Lead, St. Louis Aluminum, virgin ingot Nickel, electrolytic	\$15.38 -\$19 \$17. ound to 1 25.00 25.00 94.75† 10.00 11.80 26.16 74.00	\$15.38 50-\$19 \$17 arge buye 25.00 94.25* 10.00 11.80 26.10 74.00	7.50-\$19 \$1 25.00 25.00 92.25 10.00 11.80 26.10 74.00	32.00 32.00 97.625 11.50 15.30 27.10 74.00
Foundry coke, prompt . \$17.50 ionferrous Metals: (cents per pi Copper, electrolytic, Conn Copper, Lake, Conn. Tin, Straits, N. Y. Zinc, East St. Louis Lead, St. Louis Aluminum, virgin ingot Nickel, electrolytic Magnesium, ingot	\$15.38 -\$19 \$17. ound to 1 25.00 25.00 94.75 10.00 11.80 26.16 74.00 36.00	\$15.38 50-\$19 \$17 arge buye 25.00 94.25* 10.00 11.80 26.10 74.00 36.00	7.50-\$19 \$1 25.00 25.90 92.25 10.00 11.80 26.10 74.00 36.00	32.00 32.00 97.625 11.50 15.30 27.10 74.00 36.00
Furnace coke, prompt . \$17.50 conferrous Metals: (cents per p. Copper, electrolytic, Conn	\$15.38 -\$19 \$17. ound to 1 25.00 25.00 94.75 10.00 11.80 26.18 74.00 36.00 29.50	\$15.38 50-\$19 \$17 arge buye 25.00 94.25* 10.00 11.80 26.10 74.00	7.50-\$19 \$1 25.00 25.00 92.25 10.00 11.80 26.10 74.00	32.00 32.00 97.625 11.50 15.30 27.10 74.00

Steel Scrap Composite

Averages of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Can Price Flareup Keep Going?

Dealers strengthen resistance at first signs of life. But new buying is necessary to sustain a market rise.

More aggressive bidding on railroad lists is one tipoff of a stronger market.

 Feelings of new strength that were felt in Chicago last week spread throughout other major steelmaking areas.

Price increases this week are evident in Pittsburgh and Detroit as well as additional advances in Chicago. Dealers, who had nothing but bad news for months, were quick to increase resistance.

These are some of the reasons behind the moderate uprising:

Resistance had cut off even small tonnages necessary for mill operation.

Industrial and railroad scrap generation fell below consumption.

An improved outlook for steel.

Evidence of the stronger market is indicated in railroad lists. Generally throughout the country, they went at higher than anticipated, and much more than the advertised tonnage could have been moved.

Pittsburgh—Prices of openhearth grades are up \$1 to \$2 as dealer resistance is choking off even the small amount of scrap needed. There is a new feeling of optimism among yards. They have stepped up buying and are refusing to sell at mill prices of \$33 and \$34 for No. 1 grades. In addition, production of industrial and railroad scrap is

falling below consumption. Railroad offerings were quickly snapped up. Brokers say they could have sold twice the tonnage of specialties. Nearby districts are also becoming more active.

Chicago — Dealer prices continued to advance as brokers pushed to cover orders written only two weeks ago that are now regarded as "bad orders." Despite the apparent lack of mill buying in strong volume, the market continues very strong. After three weeks of advancing dealer prices, a flurry of mill buying reinforced the stronger tones of the market.

Philadelphia — There is little action in the domestic market. A sale of malleable at \$59, a dollar under last week's market, is the only price change reported. Export is slowing down and brokers are hunting new orders to keep scrap moving in the port. So far, they've had little luck.

New York — The market continues very dull. Steelmaking and blast furnace grades are holding at last week's prices, but movement is sluggish. Pipe foundry buying has caused some realignment of cast prices.

Detroit—There has been some movement of scrap into Canada, mostly No. 1 bundles and mixed cupola cast. This, along with increased steel production in the area, has caused dealers to tighten up on sales as they wait for higher prices. Last week No. 1 heavy melting and No. 2 heavy melting were incorrectly quoted, because of a typo-

graphical error. Correct prices were \$21 to \$22 and \$16 to \$17, respectively.

Cleveland—The market is firming despite absence of any representative size orders. Brokers have raised prices on small tonnages to cover old orders and some foundry orders. Railroad lists went for about the same as a month ago, but higher than expected. Dealers are starting to hold back now. Freight differential between Cleveland switch and Youngstown district shipment is now \$3.35, due to intra-state increase.

St. Louis — A strong undertone exists in this market along with better feelings in the steel industry. Prices are unchanged, except unstripped motor blocks which are up \$1.

Birmingham — This market has not followed Chicago's reported heavy increase in sales. Limited quantities of No. 2 heavy melting were purchased this week by an Atlanta mill at unchanged prices.

Cincinnati—Scrap is flowing in good volume to area mills at prevailing prices. Dealers are loosening up a little with their tonnage.

Buffalo—Prices of No. 1 machinery cast and No. 1 cupola cast dropped \$2 on the basis of very light buying. All turnings items are off \$1 with no consumer interest.

Boston — Some of the trade is indicating optimism, but if there is any new business, it hasn't registered yet.

West Coast—Overall picture in Los Angeles, San Francisco and Seattle continues dull and depressed. A few cargoes were shipped out at below quoted prices. There's talk that the Japanese might come into the market in June or July. Mills are buying the minimum.

Hamilton — Price of busheling, new factory, unprepared scrap has been incorrectly quoted from April 17 issue through May 8. Correct price in that interval was \$24.00.

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ropes in
one!

Here is a combination that has proved itself during three years of field testing. A welcome addition to Roebling's great line of wire ropes, Royal Blue Herringbone is both a regular lay and lang lay wire rope!

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closing lines, shovel ropes, wagon scraper ropes and dragline ropes. Without reservation, its performance has been superior to that of any other rope used for the same jobs... even in the hands of inexperienced personnel! Its proven capabilities clearly suggest its use for all jobs where steel core ropes are normally used. See your Roebling salesman for all the facts or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Roebling Herringbone, the two-in-one rope to meet the doubly stringent demands of today's economy.

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Subsidiary of The Colorado Fuel and Iron Corporation

Reg. app. for

WIRE ROPE

SCRAP PRICES (Effective May 18, 1958)

Pittsburgh

No. 1 hvy. melting			\$34.00
No. 2 hvy. melting	29.00	to	30.00
No. 1 dealer bundles	33.00	to	34.00
No. 1 factory bundles	37.00	to	38.00
No. 2 bundles	25.00	to	26.00
No. 1 busheling	33.00	to	34.00
Machine shop turn	12.00	to	13.00
Mixed bor, and ms. turn	12.00	to	13.00
Shoveling turnings	16.00		17.00
Cast iron borings	16.00	to	17.00
Low phos. punch'gs plate.	37.00	to	38.00
Heavy turnings	28.00	to	29.00
No. 1 RR hvy. melting	36.00	to	37.00
Scrap rails, random lgth	50.00	to	51.00
Rails 2 ft and under	54.00		
RR steel wheels	44.00		
RR spring steel	44.00		
RR couplers and knuckles	44.00	to	45.00
No. 1 machinery cast	48.00	to	49.00
Cupola cast	39.00	to	40.00
Heavy breakable cast	37.00	to	38.00
Stainless			
18-8 bundles and solids.	70.00	to	175.00
18-8 turnings			
430 bundles and solids	95 00	to	100.00
			45.00
410 turnings	****		10.00

Chicago

Cnicago	
No. 1 hvy. melting\$30.00 to	\$31.00
No. 2 hvy. melting 28.00 to	29.00
No. 1 dealer bundles 31.00 to	32.00
No. 1 factory bundles 37.00 to	
No. 2 bundles 22.00 to	
No. 1 busheling 30.00 to	
Machine shop turn 15.00 to	
Mixed bor. and turn 17.00 to	18.00
Shoveling turnings 17.00 to	18.00
Cast iron borings 17.00 to	18.00
Low phos. forge crops 41.00 to	42.00
Low phos. punch'gs plate. 36.00 to	37.00
Low phos. 3 ft and under 34.00 to	35.00
No. 1 RR hvy. melting 35.00 to	36.00
Scrap rails, random lgth 44.00 to	45.00
Rerolling rails 51.00 to	52.00
Rails 2 ft and under 47.00 to	48.00
Locomotive tires cut 43.00 to	44.00
Cut bolsters & side frames 40.00 to	41.00
Angles and splice bars 44.00 to	
RR steel car axles 53.00 to	54.00
RR couplers and knuckles 40.00 to	
No. 1 machinery cast 43.00 to	
Cupola cast 36.00 to	
Heavy breakable cast 34.00 to	
Cast iron brake shoes 34.00 to	
Cast iron wheels 31.00 to	
Malleable 47.00 to	
Stove plate 34.00 to	
Steel car wheels 37.00 to	38.00
Stainless	
18-8 bundles and solids. 160.00 to	165.00
18-8 turnings 80.00 to	
430 bundles and solids 90.00 to	
430 turnings 45.00 to	50.00

Philadelphia Area

No. 1 hvy. melting	33.00	to	\$35.00
No. 2 hvy. melting	29.00	to	31.00
No. 1 dealer bundles	33.00		35.00
No. 2 bundles	23.00		24.00
No. 1 busheling	33.00		
Machine shop turn	14.00		15.00
Mixed bor. short turn	15.00		
Cast iron borings	16.00		
Shoveling turnings	17.00		
Clean cast. chem. borings	31.00		
Low phos. 5 ft and under	38.00		
Low phos. 2 ft and under	39.00		
Low phos. punch'gs	39.00		
Elec furnace bundles	34.00		
Heavy turnings	28.00		
RR steel wheels	42.50		
RR spring steel	42.50		
Rails 18 in. and under			
Curs 18 m. and under	56.00		
Cupola cast	37.00		
Heavy breakable cast	40.00		
Cast iron car wheels	43.00	to	44.00
Malleable	58.00	to	59.00
Unstripped motor blocks	30.00	to	31.00
No. 1 machinery cast	47.00		

Cincinnati

Brokers buying prices per grou	s ton, on	CREA:
No. 1 hvy. melting\$	29.00 to	\$30.00
No. 2 hvy. melting	25.00 to	26.00
No. 1 dealer bundles	29.00 to	
No. 2 bundles	19.50 to	20.50
Machine shop turn		10.00
Mixed bor. and turn	10.00 to	11.00
Shoveling turnings	11.00 to	12.00
Cast iron borings	10.00 to	11.00
Low phos, 18 in. and under	36.00 to	37.00
Rails, random length	42.00 to	43.00
Rails, 18 in. and under	52.00 to	53.00
No. 1 cupola cast	38.00 to	39.00
Hvy. breakable cast	32.00 to	33.00
Drop broken cast	44.00 to	45.00

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Claveland

Cleveland		
No. 1 hvy. melting\$29.5	0 to	\$30.50
	0 to	24.00
	0 to	30.50
	0 to	33.50
No. 2 bundles 20.0	0 to	21.00
No. 1 busheling 29.5	0 to	30.50
Machine shop turn 10.0	0 to	11.00
	0 to	15.00
	o to	15.00
	0 to	15.00
Cut structural & plates, 2 ft		
	0 to	
	0 to	
	0 to	31.50
	0 to	
	0 to	36.00
	0 to	54.00
	0 to	55.00
	0 to	
	0 to	18.00
	10 to	
	o to	
	10 to	
	10 to	59.00
18-8 bundles		
	00 to	
	00 to	
430 turnings 30.0	10 to	35.00

Buffalo

bunulo			
No. 1 hvy. melting	26.00	to	\$27.00
No. 2 hvy. melting	22.00		23.00
No. 1 busheling	26.00	to	27.00
No. 1 dealer bundles	26.00	to	27.00
No. 2 bundles	20.00	to	21.00
Machine shop turn	10.00	to	
Mixed bor, and turn,	11,00	to	12.00
Shoveling turnings	13.00		
Cast iron borings	12.00		
Low phos. plate	32.00	to	33.00
Structurals and plate,			
2 ft and under	35.00		36.00
Scrap rails, random lgth	39.00		40.00
Rails 2 ft and under	49.00		
RR steel wheels	36.00	to	37.00
RR spring steel	32.00		
RR couplers and knuckles	32.00	to	
No. 1 machinery cast	43.00		
No. 1 cupola cast	39.00	to	40.00

St. Louis			
No. 1 hvy. melting	32.00	to	\$33.00
No. 2 hvy. melting	30.00		
No. 1 dealer bundles	33.00	to	34.00
No. 2 bundles	23.00	to	24.00
Machine shop turn	15.00	to	16.00
Cast iron borings	18.00	to	19.00
Shoveling turnings	18.00	to	19.00
No. 1 RR hvy. melting	35.00	to	36.00
Rails, random lengths	42.00	to	43.00
Rails, 18 in. and under	48.00	to	49.00
Angles and splice bars	43.00	to	44.00
Std. steel car axles	47.00	to	48.00
RR specialties	38.00	to	39.00
Cupola cast	43.00	to	44.00
Heavy breakable cast	32.00	to	33.00
Cast iron brake shoes	35.00	to	36,00
Stove plate	37.00	to	38.00
Cast iron car wheels	35.00	to	36.00
Rerolling rails	47.00	to	48.00
Unstripped motor blocks	34.00	to	35.00
Diih			

Birmingham			
No. 1 hvy. melting	30.00	to	\$31.00
No. 2 hvy. melting	25.00		26.00
No. 1 dealer bundles	30.00	to	31.00
No. 2 bundles	18.00	to	19.00
No. 1 busheling	30.00	to	31.00
Machine shop turn	22.00	to	23.00
Shoveling turnings	23.00	to	24.00
Cast iron borings	12.00	to	13.00
Electric furnace bundles	34.00	to	35.00
Elec. furnace, 3 ft & under	32.00	to	33.00
Bar crops and plate	36.00	to	
Structural and plate, 2 ft	35.00	to	36.00
No. 1 RR hvy. melting	32.00	to	
Scrap rails, random lgth	43.00	to	44.00
Rails, 18 in. and under	46.00	to	47.00
Angles & splice bars	38.00	to	39.00
Rerolling rails	45.00	to	46.00
No. 1 cupola cast	48.00	to	49.00
Stove plate	48.00		
Charging box cast	22.00	to	23.00
Cast iron car wheels	34.00	to	35.00
Unstripped motor blocks	38.00	to	39.00

Youngstown

No. 1	hvy.	melt	ing						\$33.00	to	\$34.00
No. 2	hvy.	melt	ing						26.50	to	27.50
No. 1	deale	r bur	ndle	8	į,		۰		33.00	to	34.00
No. 2	bund	les .				٠			23.50	to	24.50
Mach	ine sh	op ti	arn.		٠				12.50	to	13.50
Shove	ling t	urnin	gs						17.50		
Cast	iron	boring	g8						17.50	to	18.50
Low	phos.	plate	е .					٠	34.00	to	35.00

New York

III II I III I		
Brokers buying prices per gross ton,	. 01	cars:
No. 1 hvy. melting\$24.00	to	\$25.00
No. 2 hvy. melting 21.00	to	22.00
No. 2 dealer bundles 15.50		16.50
Machine shop turn 7.00		
Mixed bor, and turn, 10.00	to	11.00
Shoveling turnings 10.00	to	11.00
Clean cast. chem. borings. 22.00	to	23.00
No. 1 machinery cast 32.00		33.00
Mixed yard cast 30.00	to	31.00
Charging box cast 31.00	to	32.00
Heavy breakable cast 30.00	to	31.00
Unstripped motor blocks 22.00	to	23.00
Stainless		
18-8 prepared solids135.00	to	140.00
18-8 turnings 45.00	to	50.00
430 prepared solids 65.00	to	70.00
430 turnings 20.00		25.00

Detroit

Detroit		
Brokers buying prices per gross ton,	61	a cars:
No. 1 hvy. melting\$23.00	to	\$24.00
No. 2 hvy. melting 18.00	to	19.00
No. 1 dealer bundles 24.00	to	25.00
No. 2 bundles 14.00	to	
No. 1 busheling 23.00		
Drop forge flashings 22.00		
		7.00
Mixed bor, and turn, 7.00	to	8.00
Shoveling turnings 8.00	to	9.00
Cast iron borings 8.00		9.00
Low phos. punch'gs plate. 23.00	to	
No. 1 cupola cast 32.00		33.00
Heavy breakable cast 23.00	to	24.00
Mixed cupola cast 30.00	to	31.00
Automotive cast 31.00	to	32.00
Stainless		
18-8 bundles and solids. 155.00	to	160.00
18-8 turnings 55.00	to	60.00
430 bundles and solids 70.00	to	75.00
410 turnings 20.00	to	25.00

Boston			
Brokers buying prices per gre	sa ton,	on	cars:
No. 1 hvy. melting	22.00	to \$	23.00
No. 2 hvy. melting	18.00	to	19.00
No. 1 dealer bundles	22.00		23.00
No. 2 bundles	13.00		14.00
No. 1 busheling	22.00	to	23.00
Machine shop turn	3.00	to	4.00
Mixed bor, and short turn.	3.00		4.00
Shoveling turnings	5.00		6.00
Clean cast. chem. borings.	14.00		15.00
No. 1 machinery cast	31.00	to	32.00
Mixed cupola cast	26.00		27.00
Heavy breakable cast	27.00		28.00
Stove plate	26.00	to	27.00
Unstripped motor blocks	22.00	to	23.00

San Francisco

No. 1 hvy. melting	\$32.00
No. 2 hvy. melting	30.00
No. 1 dealer bundles	28.00
No. 2 bundles	22.00
Machine shop turn	15.00
Cast iron borings	15.00
No. 1 RR hvy. melting	32.00
No. 1 cupola cast	45.00
Los Angeles	
ros wilderes	

No. 1 hvy melting \$22.0 No. 2 hvy melting 30.8 No. 1 dealer bundles 28.0 No. 2 bundles 20.0 Machine shop turn. \$9.00 to 1.0 Shoveling turnings 11.00 to 13.0 Cast iron borings 11.00 to 13.0 Elec. furn. 1 ft and under (foundry) 43.0	
No. 1 dealer bundles 28.0 No. 2 bundles 20.0 Machine shop turn \$9.00 to 11.0 Shoveling turnings 11.00 to 13.0 Cast iron borings 11.00 to 13.0 Elec. furn. 1 ft and under	
No. 2 bundles 20.0 Machine shop turn. \$9.00 to 11.0 Shoveling turnings 11.00 to 13.0 Cast iron borings 11.00 to 13.0 Elec. furn. 1 ft and under	
Machine shop turn	
Shoveling turnings 11.00 to 13.0 Cast iron borings 11.00 to 13.0 Elec. furn. 1 ft and under	
Shoveling turnings 11.00 to 13.0 Cast iron borings 11.00 to 13.0 Elec. furn. 1 ft and under	16
Elec. furn. 1 ft and under	łij
Elec. furn. 1 ft and under	и
No. 2 RR hvy. melting 34.0	
No. 1 cupola cast 41.00 to 42.0	н
Seattle	

No. 1 hvy. melting No. 2 hvy. melting No. 2 bundles No. 1 cupola cast

Mixed yard cast	36.00
Hamilton, Ont.	
No. 1 hvy. melting	\$30.00
No. 2 hvy. melting	26.00
No. 1 dealer bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Busheling	20.00
Bush., new fact., prep'd	30.00
Bush., new fact., unprep'd	24.00
Machine shop turn	15.00
Short steel turn	19.00
Mixed bor. and turn	15.00
Rails, rerolling	39.08
Cast scrap\$45.00 to	50.00

13

look to

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STAINLESS STEEL NICKEL-CHROME





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CHICAGO, ILLINOIS

Some Support For Subsidies

Die casters favor the Seaton Plan, say it would not stifle normal competition.

But the weight of industry opinion is still against it, making compromise likely.

 Interior Secretary Fred A. Seaton found some support in industry this week for his proposal to subsidize domestic copper, lead, zinc, and tungsten producers. Initial industry reaction was sharply critical.

One of the foremost supporters of the Administration plan is the American Die Casting Institute. In a letter to President Eisenhower, David Laine, secretary, called the proposal an "incisive, necessary, and highly commendable program which offers a realistic approach to stabilization of production, and economic security to the zinc industry." In contrast to some critics, Mr. Laine believes subsidy "leaves room for the full interplay of competitive domestic and external interests."

Organized industry positions are beginning to crystallize. Here's how they stack up:

Copper — Producers are against the subsidy. They say the $271/2 \neq$ support price isn't high enough. The industry is rallying behind a bill cosponsored by 14 senators and 16 representatives calling for a $4 \neq$ per lb tariff when the domestic price is lower than $30 \neq$ per lb.

Lead, Zinc — Here also, producers say support levels aren't high enough. They would rather have the higher tariff recommended by the U. S. Tariff Commission. Some are thumping for import quotas as

well, but there is a lot of opposition on this point.

Tungsten—Producers and potential producers will take any form of support they can get. Last year they lost a heated congressional battle for government purchase of their concentrates at higher prices. At that time many said they stood to lose sizeable investments unless they got support.

Consumers generally oppose subsidies. They say it would jack up prices they must pay.

With the weight of industry opinion against the Seaton Plan, compromise appears imminent. Observers are saying the first step will be a slight modification when the plan is put into legislative form.

There are some rumblings in Washington associating support for domestic producers with the currently stagnant program to barter surplus U. S. farm goods for foreign minerals.

The Problem—The basic problem appears to be how to give domestic producers enough help, without throwing markets off balance, shifting the strain to consumers, and stepping on the economic toes of our Free World friends.

Barter may bloom again shortly. A guide, or standard contract is expected to be signed momentarily that will pull the stopper on \$20 to \$22 million in contracts held up by regulations.

Domestic Barter—Some sources say high level discussions are now in progress on the possibility of converting the program to take domestic as well as foreign metal. If this can be worked out, the State Dept. will probably not object too

strenuously, because it would not affect the ability of friendly countries to send their products here.

Industry has rarely objected to a stockpiling form of subsidy, as long as the metal taken was kept off the market indefinitely.

Copper

Chile's pitch for a world copper agreement is falling flat. The International Wrought Nonferrous Metals Council, meeting in London said, "The long term interests of copper could best be served by leaving the industry free to look after its own affairs."

At home, Revere Copper & Brass Co. dropped its price for copper water tube by 10 pct. The company said costs did not justify the move. It was made to offset the extensive inroads made by imports.

American Brass Co. "recognizing market conditions" cut its price for yellow brass free cutting rod by 1½¢ per lb. The new price, 29.53¢ per lb is effective from May 12. Other major brass mills went along almost immediately.

Tin prices for the week: May 7 —94.50; May 8—95.00; May 9—95.25; May 12—94.75; May 13—94.75.*

*Estimate

Primary Prices

(cents per lib)	Gurrent price	last price	date of change
Aluminum pig	24.00	28.00	4/1/88
Aluminum inget	20.10	28.10	4/1/58
Copper (E)	25.00	27.00	1/13/50
Copper (CS)	23.75	23.50	4/23/58
Copper (L)	25.00	27.80	1/13/58
Lead, St. L.	11.80	12.88	4/2/58
Lead, N. Y.	12.00	13.00	4/2/58
Magnesium inget	38.00	34.00	8/13/56
Magnesium plg	36.26	33.75	8/13/50
Nickel	74.00	84.88	12/8/88
Titanium sponge	185-200	200-250	4/1/88
Zinc, E. St. L.	10.00	10.60	7/1/87
Zinc, N. Y.	10.80	11.00	7/1/87

ALUMINUM: 99% ingot frt allwd. COP-PER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Volasco, Tex. NICKEL: Port Colbourne, Canada. ZINC: prime western. TIN: see above; other primary prices, pg. 126.

Take a New Look at

MUINATIT

Wonder metal? Restricted supply? Not today. Titanium is daily *proving* its economic advantages in more and more industrial applications.

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For corrosion resistance—Turbine impeller made from titanium has given four years' service in highly corrosive application that killed other metals in weeks or even hours. Impeller agitates sturry containing cobalt, nickel, copper arsenic, iron and sulfuric acid.



For technical facts write for "Titanium Fact File"—giving advantages, metallurgy, corrosion properties, information on machining, welding, forming. Our Service Engineering group is ready to assist you.



For availability — Delivery time on titanium has been cut by Mallory-Sharon's ingot inventory in certain grades and analyses. Here, orders can be started in the ingot stage, saving time for fabricators. In addition, a wide range of sheet and bar sizes can be shipped direct from stock.



For high strength-to-weight-In the U.S. Air Force's B-58 Hustler, built by Convair, Fort Worth, heat-treated titanium alloy was substituted for alloy steel-for wing fittings bearing heavy loads. Result: 44% saving in weight, with strength equal or superior to the previous material.

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MILL PRODUCTS

(Cents per lb unless otherwise noted)

(Base 30,000 lb, f.o.b. ship. pt., frt. allowed) Flat Sheet (Mill Finish) and Plate ("F" temper except 6061-9)

Alloy	.032	.081	.136-	.250- 3.
1100, 3003 6052	44.6 52.0 49.4	42.3 46.9 45.0	41.1 45.2 43.2	41.7 44.4 43.1

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	45.0-46.8	58.4-62.1
12-14 24-26	45.7-47.2	59.3-63.8 70.1-74.8
36-38	58.0-58.6	94.2-97.8

Screw Machine Stock-2011-T-3

Sise"	34	36-36	%-1	134-134
Price	61.0	60.5	89.0	56.6

Roofing Sheet, Corrugated (Per sheet, 26" wide base, 16,000 lb)

Length"→	72	98	120	144	
.019 gage	\$1.411	\$1.884	\$2.353	\$2.823	
	1.762	2.349	2.937	3.534	

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed) Sheet and Plate

Type↓ Gage→	.250 3.00	.250- 2.00	.188	.081	.032
AZ31B Stand, Grade	.,	67.9	69.0	77.9	108.1
AZ31B Spec		93.3	95.7	108.7	171.3
Tread Plate		70.6	71.7		
Tooling Plate	73.0				

Extruded Shapes

factor->	6-8	13-14	24-26	36-38
Comm. Grade. (AZ31C)	69.6	70.7	75.6	89.2
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy	Ingot		
AZ91B	(Die Casting)	37.25	(delivered)
AZ68A.	AZ92A, AZ91C (Sand C	asting) 40.75	(Velasco, Tex.

NICKEL, MONEL, INCONEL

(Base	prices, f.o	.b. mill)	
	"A" Nickel	Monel	Incone
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR .	107	89	109
Plates, HR .	120	105	121
Seamless tube	0. 157	129	200
Shot blooks		9.7	

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube	
Copper	48.13		45.36	48.32	
Brass, 70/30	42.69	43.23	42.63	45.60	
Brass, Low	44.90	45.44	44.84	47.71	
Brass, R L	45.67	46.21	45.61	48.48	
Bram, Naval	47.07		41.38	80.48	
Munts Metal	45.19		41.00		
Comm. Bs.	46.98	47.52	46.92	49.54	
Mang. Bs.	50.81		44.91		
Phos. Bs. 5%	67.17		67.67		

Free Cutting Brass Rod 29.53

TITANIUM (Freight included in 5000 lbs)

(Freight included in 5000 lbs)

Sheet and strip, commercially pure, \$8.50-\$10.10; alloy, \$15.05; Plate, HR, commercially pure, \$6.60-\$6.75; alloy, \$8.75-\$9.50. Wire, rolled and/or drawn, commercially pure, \$6.50-\$7.00; alloy, \$10.00-\$11.50; Bar, HR or forged, commercially pure, \$6.25-\$5.50; alloy, \$5.25-\$6.55; billets, HR, commercially pure, \$4.10-\$4.35; alloy, \$4.10-\$4.20.

PRIMARY METAL

(Cents per lb unless otherwise noted)
Antimony, American, Laredo, Tex., 29.56
Beryllium aluminum 5% Be, Dollar
per lb contained Be\$74.78
Permilliant contained be
Beryllium copper, per lb conta'd Be.\$48.00
Beryllium 97% lump or beads,
f.o.b. Cleveland, Reading\$71.50
Bismuth, ton lots\$ 2.26
Cadmium, del'd \$ 1.51
Cadmium, del'd\$ 1.50 Calcium, 99.9% small lots\$ 4.50
Chromium, 99.8% metallic basis\$ 1.31
Cobalt, 97-99% (per lb) \$2.00 to \$2.0
Cookit, 91-99% (per 10)\$2.00 to \$2.0
Germanium, per gm, f.o.b. Miami,
Okla., refined
Gold, U. S. Treas., per troy oz\$35.00
Indium, 99.9%, dollars per troy oz. \$ 2.20
Iridium, dollars per troy oz \$80 to \$90
Lithium, 98%\$11.00 to \$14.00
Magnesium, sticks, 100 to 500 lb, 59.00
Mercury, dollars per 76-lb flask,
f.o.b. New York\$228 to \$23
Nickel oxide sinter at Copper
Cliff, Ont., contained nickel 71.21
Palladium, dollars per troy og \$19 to \$21
Platinum, dollars per troy oz \$67 to \$70
Rhodium\$120.00 to \$125.00
Silver ingots (# per troy os.)88.62
Thomism non her truy Us. J
Thorium, per kg\$43.00
Vanadium\$ 3.4
Zirconium sponge\$ 5.00

Remelted Metals

(Ce	nte	3	н	7							21							-	01	3	rl	0	0	ıd	8)
85-5-5	ingo	ıt																							
No.						0	0		0	0	0		0		0	0		0	0	0		0	0		25,25
No.				4						a					h										34.25
No.						è	*	-		8		*			×		,				×			*	23.50
80-10-1	0 ir																								
No.	305					0												0							29.25
No.	315																		0						27.25
88-10-2	ing	O	t																						
No.	210					0.					0.		0	9		9.	0		0		0			0	36.25
No.	215																			0		0			32.00
No.	245					0		0							,					,					28.75
Yellow																									
No.	405							.0	0			0	۰	0	0		0		0		0	0		0	21.25
Manga	nese	1	b	r	0	n	g	6																	
No.	421								×	×	*	×	*	*			*	*	×	×	×	*		*	23.00
																		_							

Aluminum Ingot

(Cents per lb del'd 30,000 ll	and over)
95-5 aluminum-silicon alloys	
0.30 copper max	24.00-24.2
0.60 copper max	23.75-24.0
Piston alloys (No. 122 type)	28.25-24.2
No. 12 alum. (No. 2 grade).	21.00-21.7
108 alloy	21.50-22.2
195 alloy	24.00-25.5
13 alloy (0.60 copper max.).	23.75-24.0
AXS-679 (1 pet zinc)	21.25-22.2

(Effective May 12, 1958)

Steel deoxidizing aluminum notch bar

Grade	1-95-97%	%	0	0	0	6	0 1		.22.50-23.50
									.21.00-21.75
									.20.00-20.75
Grade	4-85-90%								.17.50-18.50

SCRAP METALS

Brass Mill Scrap
(Cents per pound, add 1¢ per lb for

	B 24 1	pmen	16.0	- 5	"	æ.	υ,	, u	U	o to and	over)
										Heavy	Turnings
Copp	er			0 0		0				31	20 %
Yello	W	bras	38		*		×			1636	14%
Red	bi	888								18%	17%
Com	m.	bron	124	В.						19 1/4	1834
		bron								14%	1436
		bras								15%	

Customs Smelters Scrap

(Cents per		carlo		, delivered
No. 1 coppe	r wire			20
No. 2 coppe	r wire			18 1/4
Light coppe	r			16 1/4
Refinery b	rasa .		* * * * *	18 17 ¼
*Dry cop			****	1174

Inget Makers Scrap (Cents per pound carload lots, delivered

to refinery)	
No. 1 copper wire	20
No. 2 copper wire	18 1/4
Light copper	16 %
No. 1 composition	181/4
No. 1 comp. turnings	18
Hvy. yellow brass solids	13
Brass pipe	15
Radiators	14%
Aluminum	
	-13
Mixed new clips 141/2-	-15 %

Mixed turnings, dry 12 ½—13 ½ Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No.	1 copper	wire		***		17%	-18	
No.	2 copper	wire				15 %	-16	
Lig	ht copper					13 %	-14	
Aut	to radiato	rs (u	DEWes	ted) .	11	-11	14
No.	1 compo	sition				1434	-15	
No.	1 compo	sition	turni	ngs		13 1/2	-14	
Coc	ks and f	aucets				12	-12	%
Cle	an heavy	yellow	bra.	. 81		10	-10	34
Bra	uss pipe					12	-12	14
Nev	w soft bra	uss clip	ppings			13	-13	16
No.	1 brass :	rod tu	rninge			10 %	-11	
		AL	and I may	_				

Alum. pistons and struts

Zinc New sinc clippings Old sinc Zinc routings

Old die cast scrap	1%-1%
Nickel and Monel	
Pure nickel clippings	42-41
Clean nickel turnings	37-40
Nickel anodes	42-41
Nickel rod ends	42-41
New Monel clippings	28-21
Clean Monel turnings	20-21
Old sheet Monel	25-26

Nickel silver clippings, mixed. Nickel silver turnings, mixed.

17

Miscellaneous

Siphon tops			 42
Small foundry type			
Monotype			
Lino, and stereotype			
Electrotype			
Hand picked type shells	1		 7 - 7%
Lino, and Stereo, dross			
Electro, dross			 214- 254

,	IRON AGE			entify produc		T			1					
	STEEL	BILLE	TS, BLC	OOMS,	PIL- ING	STI	SHAPES RUCTUR				STR	IP		
1	Bethlehem, Pa. Buffalo, N. Y. Phila., Pa. Harriaon, N. J. Conshohecken, Pa. New Bedford, Mass Johnstown, Pa. Boston, Mass. New Haven, Conn. Baltimore, Md. Phoenixville, Pa. Sparrows Pt., Md. New Britain, Bridgepart, Wallingford, Conn. Pawtucket, R. I. Worcester, Mass. Alton, Ill. Ashland, Ky. Canton-Massillon, Dever, Ohio Chicage, Ill. Franklin Park, Ill. Evanston, Ill. Cloveland, Ohoo Detroit, Mich.	Carbon Rerolling Net Ton	Carbon Forging Net Ton	Allay Net Ton	Sheet Stee I	Carbon	Hi Str. Low Alloy	Carbon Wide Flange	Hot- rolled	Cold- rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Het- rolled	Alloy Cold- rolled
	Bethlehem, Pa.			\$114.00 B3		5.325 B3	7.80 B3	5.325 B3						
		\$77.50 R3,	\$96.00 R3,	\$114.00 R3,	6.225 B3	5.325 B3	7.80 B3	5.325 B3	4.925 R3,	7.15 SIO	7.325 B3			
	Phile De	B3	B3	B3					B3	7.70 P15				
	-									1.10 712				15.05 C
			\$181.00 A2	\$121.00 .42		-	-		4,975 /12	7.20 A2	7.325 A2			10.00
*			4101.00 /12	4121.00 /12						7.60 R6				
-		\$77.50 B3	\$96.00 B3	\$114.00 B3		5.325 B3	7 80 B3							
EAST			41000							7.70 T8				15.40 T
										7.60 DI			-	
										7.15 T8				-
						5.325 P2		5.325 P2						
	Sparrows Pt., Md.								4.925 B3		7.325 B3			
	Bridgeport,			\$114.00 N8						7.60 W1,57				
	Pawtucket, R. I.									7.70 N7				15.40 N
										7.70 A5				15.20 T
						Sinch Street Street Street			5.125 L/					
			*** ** **	**** *** ***					4.925 A7	215.04		30.45.04		14.05.0
	Dover, Ohio	\$77.50 UI,	\$98.50 R3 \$96.00 UI,	\$114.00 R3, T5 \$114.00 UI,	6.225 UI	5.275 U1.	7.75 UI. YI	5.275 UI	4.925 W8.	7.15 G4 7.25 AI, T8		10.45 G4	8.10 W8,	14.85 C
	Evanston, Ill.	RS	R3,W8	R3,W8		W8,P13	14/8		N4,A1	M8			S9,13	59,G4
									5.025 G3,	7.15 A5,J3 7.25 M2,D1,	2 495 62	10.45 A5	8.10 /3	
	Detroit, Mich.			\$114.00 R5					M2	D2,G3,P11	7.425 G3	10.60 D2 10.55 G3	8.10 G3	
15	Anderson, Ind.									7.15 G4				
WEST	Duluth, Minn.	-												
MIDDLE	Gary, Ind. Harber, Indiana Sterling, Ill.	\$77.50 UI \$77.50 N4	\$96.00 UI	\$114.00 UI, YI		5.275 U1, 13 5.275 N4	7.75 UI. 13	5.275 //3	4.925 U1, 13, Y1 5.025 N4	7.15 Y/	7.325 U1, 13, Y1	10.60 Y/	8.10 UI; YI	
N	Indianapolis, Ind.	\$22.30 /14				2212/44			3.023 .117	7.30 /3				15.20 J
	Newsort, Ky.									1.00 32			8.10 49	10.20).
	Middletown, Ohio												6.16 717	
	Niles, Warren, Ohio Sharon, Pa.		\$96.00 SI, C10	\$111.00 C10,S1					4.925 R3, SI	7.15 R3,T4 SI	7.325 R3, SI	10.50 SI 10.45 R3	8.10 SI	15.05 S
	Owensboro, Ky.	\$77.50 G5	\$96.00 G5	\$114.00 G5										
	Pittaburgh, Pa. Midland, Pa. Butler, Pa. Aliquippa, Pa.	\$77.50 UI, P6	\$96.00 UI, CII,P6	\$114.00 UI, CII,B7	6.225 UI	\$.275 UI. J3	7.75 UI. J3	5.275 UI	4.925 P6	7.15 /3,84			8.10.59	15.05 S
	Weirton, Wheeling, Follanshee, W. Va.				6.225W3	\$.275 W3		5.275 W3	4.925 W3	7.15 W3,F3	7.325 W3	10.50 W3		
	Youngstown, Ohio	\$77.50 R3	\$96.00 YI, CIO	\$114.00 Y/			7.75 Y1			7.15 YI,J3	7.325 UI, YI	10.65 Y/	8.10 UI. YI	15.05 / 10.65 Y
_	Fontana, Cal.	\$88.00 K1		\$135.00 K1		6.075 K1	8.55 K1	6.225 K/	5.675 K1	9.86 K7				-
	Geneva Utah		\$96.88 C7			5.275 C7	7.75 C7							
	Kansas City, Mo.		-			5.375 S2	7.85 S2						8.35 S2	
	Los Angeles,		\$105.50 B2	\$134.00 B2		5.975 C7,	8.45 B2		5.675 C7,	9.05 /3			9.30 B2	17.25 J
WEST	Torrance, Cal.				i	812			B2	9.20 C/				
M	Minnequa, Cole.					5.575 C6 6.025 O2			6.025 C6	9.10 K1			-	
	Portland, Ore. San Francisco, Niles, Pittsburg, Cal.		\$105.50 H2			5.925 B2	8.40 B2		5.675 C7, B2					
	Seattle, Wash.		\$109.50 82			6.025 B2	8.50 B2		5.925 B2					
_	Atlanta, Ga.					5.475 .48			4.925 .48					
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	\$77.50 T2	\$96.00 T2			5.275 T2, R3,C16	7.75 T2		4.925 T2, R3,C16		7.325 T2			
003	Houston, Lone Star,		\$101.00 S2	\$119.00.52		5.375 S2	7.85 S2						8.35 S2	

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1	IRON AGE		Italics ide	ntify producers	listed in key a	at end of tabl	e. Base price	a, f.o.b. mill, ir	cents per lb.,	, unless otherw	ise noted. Ex	tras apply.	
	STEEL				SHE	ETS				WIRE	TINPL	ATE†	BLACE
F	PRICES	Hot-rolled 18 ga. & hvyr.	Cold- rolled	Galvanized	Enamel- ing	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* 1,25-lb. base box	Electro* 0.25-lb. base box	Holloware Enameling 29 ga.
	Bethlehem, Pa.												
	Buffalo, N. Y.	4.925 B3	6.05 B3				7.275 B3	8.975 B3		6.15 W6	† Special co terno doduct	ated mfg.	
	Claymont, Del.										1.25-lb. coke	base box	
	Coatesville, Pa.										price. Can-m blackplate 55 deduct \$2.20	to 128 lb. from 1.25 lb.	
	Conshohocken, Pa.	4.975 .42	6.10 /42				7.325 A2				* COKES:	K.	
	Harrisburg, Pa.										ELECTRO:	0.50-lb. add	
L	Hartford, Conn.			-							25¢; 0.75-lb. 1.00-lb. add	\$1.00. Differ-	
EAST	Johnstown, Pa.									6.15 B3	ential 1.00 lb add 65¢.	./0.Z5 lb.	
	Fairless, Pa.	4.975 UI	6.10 UI				7.325 UI	9.025 UI			\$10.15 UI	\$8.85 UI	
	New Haven, Conn.												
	Phoenixville, Pa.			-		-		-					
	Sparrows Pt., Md.	4.925 B3	6.05 B3	6.60 B3			7.275 B3	8.975 B3	9.725 B3	6.25 B3	\$10.15 B3	\$8.85 B3	
	Worcester, Mass.									6.45 A5		-	-
	Trenton, N. J.												
	Alton, III.									6.35 L1			
	Ashland, Ky	4.925 A7		6.60 A7	6.625 A7								
	Canton-Massillon, Dover, Ohio			6.60 R3, R1									
	Chicago, Joliet, Ill.	4.925 W8, Al					7.275 UI			6.15 A5, R3,W8, N4, K2			
	Sterling, III.		-							6.25 N4, K2			
	Cleveland, Ohio	4.925 R3,	6.05 R3,		6.625 R3		7.275 R3,	8.975 R3,		6.15 A5			
	Detroit, Mich.	J3 5.025 G3, M2	6.15 G3 6.05 M2				7.375 G3	9.075 G3					
	Newport, Ky	4.925 Al	6.05 AI										
MIDDLE WEST	Gary, Ind. Harbor, Indiana	4.925 UI, I3, YI	6.05 UI, 13, YI	6.60 UI, 13	6.625 UI, I3, YI	7.00 UI	7.275 UI. YI.13	8.975 UI, VI		6.15 Y/	\$88.05 UI, YI	\$8.75 /3, UI,YI	7.50 UI. YI
DOLE	Granite City, III.	5.125 G2	6.25 G2	6.88 G2	6.825 G2				-			\$8.85 G2	7.60 G2
ž	Kokomo, Ind.		-	6.70 C9				-		6.25 C9			
	Manafield, Ohio		6.05 E2			7.00 E2							-
	Middletuwn, Ohio		6.05 A7	6.60 A7	6.625 A7	7.00 A7			-				,
	Niles, Warren, Ohio Sharon, Pa.	4.925 R3, N3,S1	6.05 R3	6.60 R3	6.625 N3, SI	7.00 N3, SI,R3	7.275 R3	8.975 SI, R3				\$8.75 R3	
	Pittsburgh, Pa. Midland, Pa. Butler, Pa. Donera, Pa. Aliquippa, Pa.	4.925 U1, J3,P6	6.85 U1, J3,P6	6.60 UI, J3	6.625 UI		7.275 UI, J3	8.975 UI, J3	9.725 UI	6.15 A5, J3,P6	\$10.05 U1, J3	\$8.75 UI, J3	7.50 UI, J3
	Portsmouth, Ohio	4.925 P7	6.85 P7							6.15 P7			
	Weirten, Wheeling, Follansbee, W. Va.	4.925 W3, W5	6.05 W3, F3,W5	6.60 W3, W3		7.00 W3, W5	7.275 W3	8.975 W3			\$10.05 W5,	\$8.75 W5, W3	7.50 W5
	Youngstown, Ohio	4.925 UI, YI	6.05 YI		6.625 YI		7.275 YI	8.975 YI		6.15 Y/			
	Fontana Cal.	5.675 K1	7.30 K/				8.825 K1	18.275 KI			\$10.80 K/	\$9.50 K/	
	Geneva, Utah	5.025 C7											
	Kansas City, Mo.									6.40 S2			
WEST	Les Angeles, Torrance, Cal.									6.95 B2			
	Minnequa, Colo.									6.40 C6			
	San Francisco, Niles, Pittsburgh, Cal.	5.625 C7	7.80 C7	7.35 C7						6.95 C7	\$10.80 C7	\$9.50 C7	
_	Seattle, Wash.							-					
SOUTH	Atlanta, Ga. Fairfield, Ala. Alabama City, Ala.	4.925 T2, R3	6.05 T2, R3	6.60 T2, R3	6.625 T2					6.15 T2,	\$10.15 72	\$8.85 T2	
300	Houston, Tox.	-		-				-		6.40 S2			-

	IRON AGE				in key at end							
	STEEL			ВА	RS				PLA	TES		WIRE
1	PRICES	Carbon† Steel	Reinforc- ing	Cold . Finished	Alloy Hot- rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfrs'. Bright
	Bethlehem, Pa.				6.475 B3	8.775 B3	7.925 B3					
	Buffalo, N. Y.	5.425 R3, B3	5.425 R3,B3	7.35 B5	6.475 B3,R3	8.775 B3,B5	7.925 B3	5.10 B3		7.20 B3		7.65 W6
	Clayment, Del.		· ·					5.10 C4		7.20 C4	7.625 C4	
	Coatesville, Pa.							5.10 L4		7.20 L4	7.625 L4	
	Conshohocken, Pa.							5.20 //2	6.175 A2	7.20 //2	7.625 //2	
	Harrisburg, Pa.							5.10 P2	6.275 P2			
	Milton, Pa.	5.575 M7	5.575 M7		and the second second							
1	Hartford, Conn.			7.80 R3	_*	9.075 R3	7.925 B3		-			
EAST	Johnstown, Pa.	\$.425 B3	5.425 B3		6.475 B3			\$.10 B3		7.20 B3	7.625 B3	7.65 B3
	Fairless, Pa.	5.575 UI	5.575 UI		6.625 UI							
	Newark, N. J.			7.75 W/O		8.95 W/O						
	Camden, N. J. Bridgeport, Comn. Putnam, Conn.			7.75 P10 7.85 W10 7.80 J3	6.55 N8	8.95 P10 8.925 N8						
	Willimantic, Conn.											
	Sparrows Pt., Md.		5.425 B3					5.10 B3		7.20 B3	7.625 B3	7.75 B3
	Palmer, Worcester, Readville, Mass. Mansfield, Mass.			7.85 B5,C14		9.075 A5,B5						7.95 A5, W6
_	Spring City, Pa.			7.75 K#		8.95 K+						
	Alton, III.	5.625 L1										7.85 L1
	Ashland, Newport, Ky.							\$.10 A7,A1		7.20 Al		
	Canton, Massillon, Ohio	5.90° R3		7.30 R3, R2	6.475 R3, T5	8.775 R3,R2, T5						
	Chicago, Joliet, Waukegan, III. Harvey, III.	\$.425 U1,R3, W8,N4,P13	5.425 U1,R3, N4,P13	7.30 A5, W10,W8 B5,L2,N9	6.475 U1,R3, W8	8.775 A5, W10,W8 L2,N8,B5	7.925 UI,W8	\$.10 UI,AI, W8,I3	6.175 UI	7.29 UI,W8	7.625 UI,W8	7.65 A5,R W8,N4, K2,W7
	Cleveland, Ohio	5.425 R3	5.425 R3	7.30 A5,C13		8.77\$ A5.	7.925 R3	S.20 R3, J3	6.175 /3		7.625 R3,	7.65 A5,
	Elyria, Ohio Detroit, Mich.	5.525 G3	5.775 G3	7.55 P3 7.50 P8.85	6.475 R5 6.575 G3	C13, C18 8.775 R5 8.975 B5, P3,	8.025 G3	5.29 G3		7.35 G3	<i>J</i> 3	CI3
ST	Deleth, Mine.					P8						7.65 A5
LE WEST	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	\$.425 U1,13, Y1	5.425 UI,13, YI	7.30 R3,J3	6.475 U1,13, Y1	8.77\$ R3,M4	7.925 UI, YI	\$.10 U1,13, Y1	6.175 J3, J3	7.20 UI, YI	7.625 UI, YI,I3	7.75 M4
MIDDLE	Granite City, III.							5.30 G2				
2	Kokomo, Ind		5.525 (9									7.75 C9
	Sterling, III.	5.525 N4	5.525 N4					5.10 N#				7.75 K2
	Niles, Warren, Ohio Sharen, Pa.			7.30 CI0	6.475 C10,S1	8.775 CIO	7.925 SI	\$.10 R3,S1		7.20 SI	7.625 R3, SI	
	Owenshoro, Ky.	5.425 G5			6.475 G5							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	\$.425 UI_J3	5.425 UI, J3	7.30 A5,B4, R3,J3,C11, W10,S9,C8	6.475 U1, J3, C11, B7	8.775 A5, W10,R3,S9, C11,C8	7.925 U1,J3	\$.10 U1,J3	6.175 UI	7.20 U1, J3, B7	7.625 U1, j3, 117	7.65 A5, J3,P6
	Portsmouth, Ohio											7.65 P7
	Weirton, Wheeling, Follansbee, W. Va.							5.10 W5				
	Youngstown, Ohio	5.425 UI, R3, YI	5.425 UI, R3, YI	7.30 A5, Y1, F2	6.475 UI. YI	8.775 Y1,F2	7.925 UI, YI	5.10 UI,R3, YI		7.20 Y/	7.625 U1. R3, Y1	7.65 YI
	Emeryville, Cal. Fontana, Cal.	6.175 /5 6.125 K/	6.175 /5 6.125 K/		7.525 K/		8.625 K/	5.90 KI	1	8.00 KI	8.425 K1	
	Geneva, Utah							\$.10 C7			7.625 C7	
	Kansas City, Me.	5.675 S2	\$.675 S2		6.725 S2	-	8.175 S2		-			7.90 S2
-	Los Angeles, Torrance, Cal.	6.125 C7,B2	6.125 C7,B2	8.75 R3,P14	7.525 82	10.75 P14	8.625 B2					8.60 B2
WEST	Minnequa, Colo.	5.875 C6	5.875 C6					5.95 C6				7.90 C6
	Portland, Ore.	6.175 02	6.175 02									
	San Francisco, Niles, Pittsburg, Cal	6.125 C7 6.175 B2	6.125 C7 6.175 B2				8.675 B2					8.60 C7 C
	Seattle Wash.	6.175 B2,N6					8.675 B2	6.00 B2		8.10 B2	8.525 B2	
_	Atlanta, Ga.	5.625 //8	5.425 A8									7.65 A8
SOUTH	Fairfield, Ala. City, Birmingham, Ala.	5.425 T2,R3, C/6		7.90 C/6			7.925 72	\$.10 T2,R3			7.625 T2	7.65 T2.R
03	Houston, Ft. Worth, Lone Star, Tex.	5.675 S2	5.675 S2		6.725 S2		8.175 S2	5.20 SZ 5.20 L3	1	7.30 S2	7.725 S2	7.90 S2

STEEL PRICES

Key to Steel Producers

With Principal Offices

- Al Acme Steel Co., Chicago
- Alan Wood Steel Co., Conshohocken, Pa.
- Allegheny Ludlum Steel Corp., Pittsburgh 43
- American Cladmetals Co., Carnegie, Pa. A4
- A5 American Steel & Wire Div., Cleveland
- Angel Nail & Chaplet Co., Cleveland
- 47 Armco Steel Corp., Middletown, Ohio Atlantic Steel Co., Atlanta, Ga.
- A8
- Acme-Newport Steel Co., Newport, Ky.
- BI Babcock & Wilcox Tube Div., Beaver Falls, Pa.
- Bethlehem Pacific Coast Steel Corp., San Francisco R2
- Bethlehem Steel Co., Bethlehem, Pa.
- Blair Strip Steel Co., New Castle, Pa.
- 85 Bliss & Laughlin, Inc., Harvey, Ill.
- Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
- B7 A. M. Byers, Pittsburgh
- BB Braeburn Alloy Steel Corp., Braeburn, Pa.
- Calstrip Steel Corp., Los Angeles Carpenter Steel Co., Reading, Pa. CZ
- C Central Iron & Steel Co., Harrisburg, Pa.
- Claymont Products Dept., Claymont, Del. CK
- Colorado Fuel & Iron Corp., Denver
- C7 Columbia Geneva Steel Div., San Francisco
- CS Columbia Steel & Shafting Co., Pittsburgh
- 0 Continental Steel Corp., Kokomo, Ind.
- C10 Copperweld Steel Co., Pittsburgh, Pa.
- CII Crucible Steel Co. of America, Pittsburgh
- Cuyahoga Steel & Wire Co., Cleveland
- C14 Compressed Steel Shafting Co., Readville, Mass.
- C15 G. O. Carlson, Inc., Thorndale, Pa.
- C16 Connors Steel Div., Birmingham
- C17 Chester Blast Furnace, Inc., Chester, Pa.
- C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.
- DI Detroit Steel Corp., Detroit
- D2 Dearborn Div., Sharon Steel Corp.
- D3 Driver Harris Co., Harrison, N. J.
- Dickson Weatherproof Nail Co., Evanston, Ill.
- Eastern Stainless Steel Corp., Baltimore EI
- E2 Empire Steel Co., Mansfield, O.
- Firth Sterling, Inc., McKeesport, Pa. FI
- Fitzaimons Steel Corp., Youngstown F2
- Follansbee Steel Corp., Follansbee, W. Va.

- G2 Granite City Steel Co., Granite City, Ill.
- 63 Great Lakes Steel Corp., Detroit
- G# Greer Steel Co., Dover, O.
- G5 Green River Steel Corp., Owenboro, Ky.
- HI Hanna Furnace Corp., Detroit
- 12 Ingersoll Steel Div., Chicago
- 13 Inland Steel Co., Chicago 14 Interlake Iron Corp., Cleveland
- JI Jackson Iron & Steel Co., Jackson, O.
- J2 Jessop Steel Corp., Washington, Pa. J3 Jones & Laughlin Steel Corp., Pittsburgh
- Joslyn Mfg. & Supply Co., Chicago
- J5 Judson Steel Corp., Emeryville, Calif.
- KI Kaiser Steel Corp., Fontana, Cal.
- K2 Keystone Steel & Wire Co., Peoria
- K3 Koppers Co., Granite City, Itl. K# Keystone Drawn Steel Co., Spring City, Pa.
- L1 Laclede Steel Co., St. Louis
- L2 La Salle Steel Co., Chicago
- L3 Lone Star Steel Co., Dallas
- L4 Lukens Steel Co., Coatesville, Pa.
- MI Mahoning Valley Steel Co., Niles, O.
- M2 McLouth Steel Corp., Detroit
- M3 Mercer Tube & Mfg. Co., Sharon, Pa.
- M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
- M6 Mystic Iron Works, Everett, Mass. M7 Milton Steel Products Div., Milton, Pa.
- M8 Mill Strip Products Co., Evanston, Ill.
- NI National Supply Co., Pittsburgh
- N2 National Tube Div., Pittsburgh
- N3 Niles Rolling Mill Div., Niles, O.
- N4 Northwestern Steel & Wire Co., Sterling, Ill.
- N6 Northwest Steel Rolling Mills, Seattle
- Newman Crosby Steel Co., Pawtucket, R. I.
- N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
- N9 Nelson Steel & Wire Co.
- Ol Oliver Iron & Steel Co., Pittsburgh
- 02 Oregon Steel Mills, Portland
- PI Page Steel & Wire Div., Monessen, Pa.
- P2 Phoenix Iron & Steel Co., Phoenixville, Pa.
- P3 Pilgrim Drawn Steel Div., Plymouth, Mich. P4 Pittaburgh Coke & Chemical Co., Pittaburgh
- P5 Pittsburgh Screw & Bolt Co., Pittsburgh
- P6 Pittsburgh Steel Co., Pittsburgh
- P7 Portsmouth Div., Detroit Steel Corp., Detroit

- P8 Plymouth Steel Co., Detroit
- P9 Pacific States Steel Co., Niles, Cal.
- P10 Precision Drawn Steel Co., Camden, N. J.
- P11 Production Steel Strip Corp., Detroit
- P13 Phoenix Mfg. Co., Joliet, Ill.
- P14 Pacific Tube Co.
- P15 Philadelphia Steel and Wire Corp.
- RI Reeves Steel & Mfg. Co., Dover, O.
- R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
- R3 Republic Steel Corp., Cleveland R4 Roebling Sons Co., John A., Trenton, N. J.
- R5 J. & L. Steel Co., Stainless Div.
- 86 Rodney Metals, Inc., New Bedford, Mass. R7 Rome Strip Steel Co., Rome, N. Y.
- S1 Sharon Steel Corp., Sharon, Pa.
- 52 Sheffield Steel Div., Kansas City
- \$3 Shenango Furnace Co., Pittsburgh
- S# Simonds Saw and Steel Co., Fitchburg, Mass.
- S5 Sweet's Steel Co., Williamsport, Pa.
- S6 Standard Forging Corp., Chicago S7 Stanley Works, New Britain, Conn.
- Superior Drawn Steel Co., Monaca, Pa.
- S9 Superior Steel Dlv. of Copperweld Steel Co., Carnegic, Pa.
- \$10 Seneca Strel Service, Buffalo
- SII Southern Electric Steel Co., Birmingham
- Tonawanda Iron Div., N. Tonawanda, N. Y.Tonnessee Coal & Iron Div., Fairfield
- 73 Tennessee Products & Chem. Corp., Nashville
- 74 Thomas Strip Div., Warren, O. 75 Timken Steel & Tube Div., Canton, O.
- 77 Texas Steel Co., Fort Worth
- 78 Thompson Wire Co., Boston
- Ul United States Steel Corp., Pittsburgh
- U2 Universal-Cyclopa Steel Corp., Bridgeville, Pa.
- U3 Ulbrich Stainless Steels, Wallingford, Conn.
- U4 U. S. Pipe & Foundry Co., Birmingham
- W1 Wallingford Steel Co., Wallingford, Conn
- W2 Washington Steel Corp., Washington, Pa. W3 Weirton Steel Co., Weirton, W. Va.
- W# Wheatland Tube Co., Wheatland, Pa
- W/5 Wheeling Steel Corp., Wheeling, W. Va. W/6 Wickwire Spencer Steel Div., Buffalo W/7 Wilson Steel & Wire Co., Chicago
- W8 Wisconsin Steel Div., S. Chicago, Ill. W9 Woodward Iron Co., Woodward, Ala.
- W10 Wyckoff Steel Co., Pittsburgh W12 Wallace Barnes Steel Div., Bristol, Conn.
- YI Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about \$200 per not ton.

							BUT	TWELD										SEAN	ALESS			
	3/2	In.	34	ln.	1	In.	134	In.	13-	ξ In.	2	la.	23/2	-3 In.	2	In.	23	½ ln.	3	In.	334	-4 In.
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Bik.	Gal.	Bik.	Gal.	Bik.	Gal.	Blk.	Gal.	Blk.	Gal
Sparrows Pt. B3 Youngstown R3 Fentana K1 Pittshurch J3	3.25 5.25 +8.25 5.25	+10.0 +23.5	8.25	+8.0 +6.0 +19.5 +6.0	11.75	+1.50	12.25 14.25 0.75 14.25	+0.75 +14.25		0.25 +13.25		0.75 +12.75	16.75	0.50 +13.00				+19.50				******
Alton, Ill. L1 Sharon M3 Fairless N2 Pittsburgh N1.	3.25 5.25 3.25 5.25 5.25	+12.0 +10.0 +12.0	6.25 8.25 6.25	+8.0 +6.0 +8.0 +6.0	9.75 11.75 9.75	+3.50 +1.50 +3.50	12.25 14.25 12.25	+2.75 +0.75 +2.75	12.75 14.75 12.75	+1.75 0.25 +1.75	13.25 15.25 13.25	+1.25 0.75 +1.25	14.75	+1.50				+19.50				
Wheeling W5 Wheatland W4 Youngstown Y1 Indiana Harbor Y1		+10.0 +10.0 +11.0	8.25 8.25 7.25		10.75	+1.50 +1.50 +2.50	14.25 14.25 13.25	+0.75 +0.75 +1.75	14.75 14.75 13.25	0.25 0.25 +0.75	15.25 15.25 14.25	0.75 0.75 +0.25	16.75 16.75 16.75 15.75	0.50 0.50 0.50	*9.25	+24.25	*2.75	+19.50	*0.25	+17.0	1.25	
EXTRA STRONG PLAIN ENDS Snarrows Pt. B3	7.75	+10.0	8.25	+0.0	11.75	+1.50	14.25						16.75	9.50				+ 19.30				
Youngstown R3 Fairless N2 Fontana K7 Pittaburgh 13	9.75 7.75 +3.75 9.75	+4.0	13.75 11.75 0.25	fint	16.75	4.50 2.50	17.25 15.25 3.75	3.25 1.25	17.75 15.75 4.25	4.2S 2.2S	18.25 16.25 4.75	4.75 2.75	18.75 16.75 5.25					+16.0				
Alton, Ill. £1 Sharon M3 Pittaburgh N1	7.75 9.75 9.75		11.75 13.75 13.75	+2.0 list list	14.75 16.75 16.75	4.50 2.50 4.50 4.50	17.25 17.25	3.25 1.25 3.25 3.25	15.75 17.75 17.75	2.25 4.25 4.25	16.25 18.25 18.25	2.75 4.75 4.75	18,75 16,75 18,75 18,75	1.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Wheeling W5 Wheatland W4 Youngstown Y1 Indiana Harbor Y1	9.75 9.75 9.75 8.75	+4.0 +4.0 +5.0	13.75 13.75 12.75	list list +1.0	16.75 16.75 16.75 15.75	4.50 4.50 4.50 3.50	17.25 16.25	3.25 3.25 3.25 2.25	17.75 17.75 16.75	4.25 4.25 3.25	18.25 18.25 17.25	4.75 4.75 3.75	18.75 18.75 18.75 17.75	2.50	+7.75	+21.75	*0.25	+16.0	2.25	+13.50	7.25	+8.50
Lerain N2	9.75	+4.0	13.75	list	16.75	4.50	17.25	3.25	17.75	4.25	18.25	4.75	18.75	3.50	1.73	+21.73	W. Z3	+16.0	2.25	+13.50	1.25	+8.50

Threads only, buttwold and seamless 2½ pt. higher discount. Plain ends, buttwold and seamless, 3-in. and under, 5½ pt. higher discount. Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1½, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower d'acounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis sinc price now 19¢ per lb.

13

17

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill) Pet. Discounts

Machine and Carriage Bolts	Full Con- tainer Price	30 Con- tainers	20,000 Lb.	40,000 Lb.
15" and smaller x 6" and shorter	49	54	56	57
%" thru I" x longer than 6"	35	40	43	45
Rolled thread carriage bolts 1/2" & smaller 5 6" and shorter	49	54	56	57
Lag, all diam. x 6" & shorter	49	54	56	57
Lag, all diam, longer than 6 in.	39	4434	47	4836
Plow bolts, 15" and smaller x 6" and shorter	49	54	56	57

(Add 25 pct for broken case	quantities)
Nuts, Hex, HP reg. & hvy.	Full case or Keg price
14 in. or smaller	55 1/2
C. P. Hex, reg. & hvy. \$\frac{3}{4} \text{ in. and smaller} \\ \$\frac{7}{5} \text{ in. to } 1\frac{1}{4} \text{ in. inclusive} \\ \$1\frac{5}{6} \text{ in. and larger}	551/2
Hot Galv. Hex Nuts (All % in. and smaller	
Semi-finished Hex Nuts § in. or smaller † in. to 1½ in. inclusive † in. and larger	55 1/2

(Add 25	pet for		
Finished	smaller	 	 63

a in. min	CHARLESTON					0.0
Rivets						
				Base	per	100 lt
1/2 in. and	larger		* *	 p	it o	\$12.25
7/16 in. an	d small	ler		 		19

Can Serows

Cap screws			
		Package	
Full Finished 1	1. C.	Heat Tre	aat
New std. hex head, pack-			
aged			
%" diam. and smaller x			
6" and shorter	40	26	
%". %", and 1" diam. x			
%", %", and 1" diam. x	22	3	
%" diam, and smaller x			
longer than 6"	8	+13	
%", %", and 1" diam, x			
longer than 6"	- 6	+32	
	C	-1018 Ste	eel
	Fu	11-Finish	red
	C	rtons Bu	alk
%" through %" dia. x 6"	-		
and shorter	58	49	
%" through 1" dia. x 6"			
and shorter	4.5	33	
Minimum quantity-4	" th	rough 8	10 10
diam., 15,000 pieces; 1/1	6" 11	rough 6	V. H
diam., 5,000 pieces; % " tl	roug	1" dia	111
2,000 pieces.			

Machine Screws & Stove Bolts

Plain Finis Cartons	Mach. Screws	Stove Bolts	
Bulk	Quantity	60	60
To ¼" diam. incl.	25,000-and over	60	**
5/16 to %" diam. incl.	15,000-200,000	60	

Discount

Machine Screws & Stove Bolt Nuts

		Di	scount
In Cartons	Quantity	Hex 16	Squar 19
In Bulk %" diam. & smaller	25,000 and over	14	16

CAST IRON WATER PIPE INDEX

Birmingham																	125.8
New York .	0 0		0							v						٠	138.7
Chicago										۰				0	0	0	140.9
San Francisc	30-	L		A.									0	0	0	0	148.6
Dec. 1935.	. 1	ra.	li	se.		0	la	18:	8	1	В	-	01	P	1	he	eavier
5 in. or larg	er	. 1	be	11	-	3 28	d	8	192	60	10	1	2	ıi	D	е.	Ex-
planation: 1	9.	5	7		8	ei	30		1			11	à	3			issue.
Source: U. S	3	Pi	90	e	a	11.0	1	F	01	43	10	9	M	-	Ö.	o.	

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)
Copper
Rolled elliptical, 18 in. or longer, 5000 lb lots 40.00
Electrodeposited 31.25
Brass, 80-20, ball anodes, 2000 lb
or more 44.00
Zinc, ball anodes, 2000 lb lots 16.00 (for elliptical add 1¢ per lb)
Nickel, 99 pet plus, rolled carbon, 5000 lb1.0221 (Rolled depolarized add 3¢ per lb)
Cadmium 1.55
Tin, ball anodes \$1.13 per lb (approx.).
Chemicals
(Cents per lb, f.o.b. shipping point)
Copper cyanide, 100 lb drum 68.70
Conner sulphate 100 lb bags, per

copper authinite, too in name,	300	00 15
CWL	0.0	22.10
Nickel salts, single, 100 lb bags.		40.50
Nickel chloride, freight allowed,		
300 lb		48.50
Sodium cyanide, domestic, f.o.b.		
N. Y., 200 lb drums		24.05
(Philadelphia price 24.50)	
Zinc cyanide, 100 lb		60.75
Potassium cyanide, 100 lb drum		
N. Y		48.00
Chromic acid. flake type, 10,000	10	
or more		31.00

METAL POWDERS

Per pound, f.o.b. shipping point, i	n ton
lots for minus 100 mesh	
Swedish sponge iron, del. East of	
Miss. River, ocean bags, 23,000	10.5€
F.O.B. Riverton or Camden, New	10.04
Jersey, west of Miss. River	9.5¢
Domestic sponge iron, 98+% Fe,	

of Miss. River	10.5¢
F.O.B. Riverton, New Jersey, West	
of Miss. River	9.5€
Canadian sponge iron, del'd in East, carloads	10.5¢
Electrolytic iron, annealed, imported 99.5+% Fe domestic 99.5+% Fe	27.5¢ 36.5¢
Electrolytic iron, unannealed minus 325 mesh, 99+% Fe	57.0€

stock, 99.84% pure	27.0€
Carbonyl fron size 3 to 20	
micron, 98%, 99.8+% Fe88.0¢	to \$2.85
Aluminum, freight allowed Brass, 10 ton lots31.1¢	to 47.1€
Copper, electrolytic	41.50€
Cadmium, 100-199 lb. 95¢ plus meta	al value
Chromium, electrolytic, 99.85% min. Fe. 03 max. Del'd	\$5.00
Lead	b. plant
Manganese f.o.b. Extron, Pa.	46.9€

Molybdenum, 99%\$3.60 to	\$3.95
Nickel, chemically precipitated	\$1.05
Nickel, unannealed	\$1.00
	\$1.06
Nickel, spherical, unannealed	
#80	\$1.13
Silicon	3.50€
Solder powder13¢ plus met.	
Stainless steel, 316	
SHRIBLESS STORY OLD THEFTH	4-1-1-0

Tin .						1	4.00€	plus	metal	value
Tung	st	en,	990	%	(6	5	mesh	\$3.	15 (non	ninal)
Zine,	5	000	lb	Æ	6	V	er		17.5¢ to	30.7€

Metropolitan Price, dollars per 100 lb. WARE-HOUSES Strip Plates Shapes Alloy Bars

HOUSES		Sheets		Strip	Plates	Shapes	Ba	ra		Amoy	Bara			
Cities City Delivery; Charge	Het-Rulled (18 ga. & bvr.)	Cold-Rolled (15 gage)	Calvandard (10 gage) ††	Hot-Raffed		Standard Structura !	Hot-Rolled (merchant)	Cold. Finished	Hat-Railed 6615 As relied	Hot-Rolled (148 Annealed	Cold-Drawn 4615 As rolled	Cold-Draws 4148 Annealed		
Atlanta	8.59	9.87	10.13	8.64	8.97	9.85	9.01	10.68						
Haltimere 3.10	8.38	8.98	9.78	8.86	8.76	9.29	9.16	10.69*	16.28	15.28	19.83	19.08		
Birmingham 15	8.18	9.45	10.15	8.23	8.56	8.64	8.68	10.57		******				
Boston 10	9.48	10.54	11.55	9.52	9.82	9.73	9.83	13.00	16.38	15.38	19.93	19.18		
Buffalo	8.40	9.15	11.22	8.65	9.05	9.05	8.95	11.15*	16.34	15, 15	19.01	18.95		
Chicago 15	8.35	9.60	10.25	8.38	8.71	8.79	8.75	8.95	15,80	14.80	19.35	18,60		
Cincinnati 15	8.49	9.65	10.25	8.69	9.08	9.33	9.07	9.46	15,61	15.11	18,96	18,91		
Cleveland15	8.33	9.60	10 35	8.48	8.94	9.16	8.84	10.95*	15.89	14.59	19.29	18,69		
Denver20	9.78	11.30	12.49	9.80	9.70	9.80	9.98	10.65				17.60		
Detreit	8.58	9.85	10.60	8.73	9.06	9.33	9.05	9.30	15,46	15.06	18,81	18.86		
Houston	7.30	8.05		7.25	8.85	7.25	7.28	11.10	16.20	15.25	19.65	19.95		
Kansas City20	9.02	10.27	10.82	9.05	9.38	9.46	9.42	9.87	20.02	15.47	20.02	19.27		
Los Angeles	9.70**	9.50	11.80	8.90	8.85	8.70	8.75	12.10*	17.05	16,10	21.95	20.35		
Memphia15	8.55	9.80		8,60	8.93	9.01	8.97	12 11*		*****				
Milwaukee15	8.48	9.73	10.38	8.51	8.84	9.00	8.88	9.18	15.93	14.93	19.48	18.73		
New York 10	8.97	10.23	10.66	9.41	9.53	9.45	9.67	12.86"	16.19	15, 19	19.74	18.99		
Norfolk	8.20			8.98	8.65	9.20	8.90	10.70		******				
Philadelphia 10	8.10	9.00	10.02	8.79	8.87	8.60	8.75	11.61*	16.11	15.11	19.66	18.91		
Pittsburgh15	8.33	9.68	10.60	8.48	8.71	8.79	8.75	10.95*	15.80	14.80	19.35	18.60		
Portland	10.001	11.752	13.303	11.954	10.105	11,106	9.857	11,34*	18,50	17.45	20.75	20.25		
San Francisco 10	9.45	10.85	11.10	9.55	9.70	9.60	9.80	13.10	17.05	16, 10	21.05	20.35		
Seattle	9.95	11.15	12.20	10.00	9.70	9.80	10.10	14.05	17.15	16.35	20.65	20.15		
Spokane	10.10	11.30	12.15	10.15	9.85	9.95	10.25	14.20		17.35	21.55	21.05		
St. Louis 15	8.69	9.94	10.61	8.74	9.88	9.25	9.12	9.56	16, 16	15.16	19.71	18.96		
St. Paul	8.94	10.19	10.86	8.99	9.45	9.53	9.37	9.81		15.41		19.21		

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. "All sizes except 18 and 16 gage.

17 10¢ zinc. 2 Deduct for country delivery. C1018—1 in. rounds. 10 ga. x 36" x 120"; 20 ga. x 36" x 120"; 26 ga. x 30" x 96"; 4% x 1" in lots of 1000 to 9999; 8 sheared plate 14" x 84" in lots of 1000 to 9999; 8 x 5.70" in lots of 1000 to 9999; 8 M-1020—1-in. rounds in lots of 1000 to 9999.

TOOL STEEL

	. mill			-	**	
W	Cr	V	Mo	Co	per lb	SAE
18	4	1	-	-	\$1.795	T-1
18	4	1		5	2.50	T-4
18	4	2		-	1.96	T-2
1.5	4	1.5	8	-	1.155	M-1
6	4	8	6	-	1.545	M-3
6	4	2	5	-	1.30	M-2
High	-carbo	on chi	romiu	m	.925 D	
Oil	harder	ned m	angai	nese	.475	0-2
	ial ca				.36	W-1
	a car				.36	W-1
	ılar ca				.305	W-1
					nd east o	of Mis-
					igher. W	Vest of
Miss	issinni	6.6 h	igher			

CLAD STEEL Base prices, cents					per lb f.o.b.
		Plate (A3, J2,	Sheet (12)	
_	Cladding	10 pct	15 pct	20 pct	20 pct
	302				37.50
	304	37.95	42.25	46.78	40.00
2	316	44.40	49.50	54.50	58.75
a Ty	321	40.05	44.60	49.30	47.25
Stainless Type	347	42.40	47.55	52.88	57.00
Sta	405	29.85	33.35	36.85	****
	410	29.55	33.10	36.70	
	430	29.80	33.55	37.25	

CR Strip (S9) Copper, 10 pct, 2 sides, 38.75; 1 side, 33.10.

RAILS, TRACK SUPPLIES

F.a.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Screw Spikes	Tie Plates	Track Bolts Univested
Bessemer UI							
Cleveland R3							
So. Chicago R3.							
Engley T2	5.525	6.50					
Fairfield T2		6.50		9.75		6.60	
Gary UI	5.525					6.60	
Huntington C16		6.50					
Ind. Harbor 13.	5.525		6.975	9.75		6.60	
Ind. Harbor YI.				9.75			
Johnstown B3.		6.50					
Jolist [/!			6.975				
Kansas City S2				9.75			14.75
Kansas City S2. Lackawanna B3	5.525	6.50	6.975	2110		6,60	
Lebanon B3			6.975		14.50		
Minnegua C6	5 525	7 00	6 975	0.75		6 60	14.75
Pittaburgh P5							
Pittaburgh /3		1101		9.75			
Seattle B2				10.25		6.75	15.75
Steeling R3	E ESE	****	6 975	14.00		5. 60	
Steelinn B3 Struthers Y1	4-26-3	+***	0.010	0 75		0.00	*****
Torrance C7		***				6 75	
Williamsport S5		6 50					

COKE

	Net-Ton
Connellsville, Pa\$15.00	to \$15.75
Foundry, beehive (f.o.b.)	
\$17.50	to \$19.00
Foundry oven coke	
Buffalo, del'd	\$31.75
Detroit, f.o.b.	30.50
New England, del'd	
Kearney, N. J., f.o.b.	29.75
Philadelphia, f.o.b.	29.50
Swedeland, Pa., f.o.b.	29.50
Painesville, Ohio, f.o.b.	30.50
Erle, Pa., f.o.b.	30.50
Cleveland, del'd	32.65
Cincinnati del'd	31.84
Cincinnati, del'd	00.75
St. Paul, f.o.b.	29.75
St. Louis, f.o.b.	31.50
Birmingham, f.o.b.	28.85
Milwaukee, f.o.b.	30.50
Neville, Is., Pa	29.25

LAKE SUPERIOR ORES

51.50% Fe lower Lake Freight cl	ports. Pri	ces fo	ller's	8 season.
Openhearth	lump			
Old range,	bessemer			. 11.85
Old range,	nonbessem	er		. 11.70
Mesabi, bes	ssemer	****		. 11.60
Mesabi, nor				
High phosp	horus	****		. 11.45

ELECTRICAL SHEETS

22-Gage	Hot-Rolled	Cald-Reduced (Coiled or Cut Length)			
F.o.b. Mill Cents Per Lb	(Cut Lengths)*	Semi- Processed	Fully Processed		
Field		9.625	22724		
Armature	11.10	10.85	11.35		
Elect Special Motor	11.80	11.55	12.05		
Motor	12.99	12.10	13.15		
Dyname	13.95	13.70	14.20		
Trans. 72	15.00	14.75	15.25		
Trans. 65	15.55	Grain Oriented			
Trans. 58	16.05	Trans. 66			
Trans. 52	17.10	Trans. 80 19.26 Trans. 73 19.70			

Producing points: Beech Bottom (W5); Brackenridge A3; Granite City (C2); Indiana Harber (A3); Manafold E2; Newport, Ky. (A9); Nilea, O. (N3); Vandergrift U1); Warren, O. (R3); Zaneaville, Butler (A7).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE			CARBON*			
Diam. (ln.)	Length (In.)	Price	Diam. (ln.)	Length (ln.)	Price	
24	84	26.00	40	100, 110	10.70	
28	72	25.25	35	110	10.70	
18	72	25.75	30	110	10.85	
14	72	25.75	24	72 to 84	11.25	
12	72	26.25	29	90	11.00	
10	60	28.00	17	72	11.40	
10	48	28.50	14	72	11.85	
7	60	28.25	12	60	12.95	
6	60	31.50	10	68	13.00	
4	40	35.00	8	60	13.30	
3	40	37.00				
216	30	39.25		1 1		
2	24	60.75				

• Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads	
First quality, Ill., Ky., Md., Mo., O	hio, Pa.
(except Salina, Pa., add \$5.00)	\$135.00
No. 1 Ohio	120.00
Sec. Quality, Pa., Md., Ky., Mo., Ill.	120.00
No. 2 Ohio	103.00
Ground fire clay, net ton, bulk	
(except Salina, Pa., add \$2.00)	
the same and the s	

Silica Brick

. Union, Pa., Ensley, Ala \$150.	0
ilds, Hays, Pa	0
icago District 160.	
estern Utah 175.	
lifornia 180.	õ
per Duty	
Hays, Pa., Athens, Tex., Wind-	
ham, Warren, O., Morrisville	
157.00-160.	0
lica cement, net ton, bulk, Latrobe 28.	
ica cement, net ton, bulk, Chi-	**

cago	25.50
Silica cement, net ton, bulk, Ens-	
ley, Ala	26.50
Silica cement, net ton, bulk, Mt.	
Union	24.50
Silica cement, net ton, bulk, Utah	
and Calif	37.00

Chrome Brick	Per net ton
Standard chem	
iner, Calif.	 115.00
Burned, Balt.	 99.00

Magnesite Brick

Standard	Baltimore	*****	 	*	. 8	131.	0
Chemically							

Grain Ma	gnesi	le	St.	%	to 1/4-in.	grains
Domestic,						\$73.00
Domestic,		Ch	ewal	ah,	Wash.,	
Luning,	Nev.					46.00
in sack	8			* * * *	52.0	0-54.00

Dead Burn	ed D	olo	m	14	e				P	e	y	net	ton
F.o.b. bulk, Pa., W.	Va.,	Oh	ilo			*		*	×				6.75
Midwest Missouri	Vall	ey'	* *	* *			*						7.00 5.00

(Effective May 12, 1958)

MERCHANT WIRE PRODUCTS

	Standard Q Costed Nails	Waren Wire Fence	"T" Fence Posts	Single Loop Bale Ties	Galv. Barbed and Twisted Barbless Wire	Merch. Wire Ann'ld	Merch. Wire Galv.
F.o.b. Mill	Col	Col	Col	Col	Col	¢/lb.	¢/lb.
	173 173 175 175	187 190 192 192	178	212 214 214	198	8.65	9.20 9.325 9.425 9.425**
Buffale W6 Chicago N4°°° Cleveland A6	173	190	172	212	196	8.65	8.95° 9.325
Cleveland A5 Crawf'dav. M4** Donora, Pa. A5 Duluth A5	175 173	192 187 187		212	198	8.75	9.425 9.20 9.20
Fairfield, Ala. 72 Galveston D4 Houston S2	9.101	192		217	193 198 203	8.90	9.28 9.45 9.675
Johnstown B3**. Joliet, Ill. A5 Kokomo C9*	173	190 187 189	172	212	196** 193 195*	8.65 8.65 8.75	9.325°° 9.20 9.30°
L. Angeles B2*** Kansas City S2*. Minnequa C6† Monessen P6		192 192		217	198° 1981 193	8.90	10.275 9.45° 9.45† 9.20
Pal mer, Mass. W6 Pittsburg, Cal. C7 Rankin, Pa. A5	192 173	210 187			213 193	8.95 9.60 8.65	9.50° 10.15 9.20
So. Chicago R3. S. San Fran. C6† SparrowsPt. B3**	175	187	1 79	236 214		9.60	9.20 10.15† 9.425 9.425
Sterling, Ill. N4*** Struthers, O. Y1° Worcester A5 Williamaport S5.	179					8.65	9.30

Zinc less than .10¢.
11-12¢ zinc.
10¢ zinc.
Plus zinc extras.
Wholesalers only.

C-R SPRING STEEL

		CARB	ON CO	NTEN	r
Cents Per Lb F.o.b. Mill		0.41- 0.60	0.61- 0.80	0.81- 1.05	1.06-
Baltimore, Md. 78	9.50	10.70	12,90	15.90	18.85
Bristol, Conn. W/2		10.70	12.90	16.10	19.30
Besten T8	9.50	10.78	12.90	15.90	18.85
Buffalo, N. Y. R7	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. S9	8.95	10.40	12.60	15.60	18.55
Cleveland A5		10.40	12.60	15.60	18.55
Dearborn SI	9.05	10.50	12.70		
Detroit D1	9.05	10.50	12.70	15.70	
Detroit D2	9.05	10.50	12.70		
Dover, O. G4	8.95	10.40	12.60	15,60	18.55
Evanaton, Ill. M8			12.60		
Franklin Park, III. 78			12.60		18.55
Harrison, N. J. C//			12.90		19.30
Indianapolis 13		10.95	12.60	15,60	18.55
Los Angeles Cl			14.80	17.80	
New Castle, Pa. B4		10.40	12.60	15.60	
New Haven, Conn. DI.		10.70	12.90	15.90	
Pawtucket, R. I. N7		10.70	12.90	15.98	18.85
Pittsburgh S7	8.95	10.46	12.60	15.60	18.55
Riverdale, Ill. Al			12.60	15.60	18.55
Sharon, Pa. Sl		10.40	12.60	15.60	18.55
Trenton, Rf			12.90	16.10	19.30
Wallingford W1	9.46		12.90	15.90	18.55
Warren, Ohio T4		10.46	12.60	15.60	18,75
Worcester, Mass. 45			12.90	15.90	18.85
Youngstown 13			12.60	15.60	18.55

BOILER TUBES

\$ per 100 ft. carload lots.	82	ine	Sean	Elec. Weld	
cut 10 to 24 ft. F.o.b. Mill	OD- la.	B.W. Ga.	H.R.	C.D.	H.R.
Babesck & Wilcox	2 23/2 3 33/2 4	13 12 12 12 11 10	36,34 48,94 56,51 65,97 87,61		35.22 47.43 54.77 63.93 85.53
National Tube	2 21/2 3 31/2 4	12 12 12 11 10	36.34 48.94 56.51 65.97 87.61	42.56 57.31 66.18 77.25 102.50	35.22 47.43 54.77 63.93 85.53
Pittaburgh Steel	2 21/2 3 31/2 4	13 12 12 11 10	36.34 48.94 56.51 65.97 87.61	57.31 66.18 77.25	

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. B6	68.00	68.50	69.00	69.50	
Birmingham R3	62.00	62.50°			
Birmingham W9.	62.00	62.50*	66.50		
Birmingham U4	62.00	62.50°	66.50		
Buffalo R	66.00	66.50	67.00	67.50	
Buffalo HI	66.00	66.50	67.00	67.50	
Buffalo W6	66.00	66.50	67.00	67.50	
Chester P2	66.50	67.00	67.50		
Cinicago 14	66.00	66.50	66.50	67 00	
Cleveland A5	66.00	66.50	66.50	67.00	71.00
Cleveland R3	66.80	66.50	66.50	67.00	
Du'uth 14	66.80	66.50	66.50	67.00	71.00
Erie 14	65.80	66,50	66.50	67.00	71.00
Everett M6	67.58	68.00	68.50		
Fontana K/	75.00	75.50			
Geneva, Utah C7	66.00	66.50			
Granite City G2	67.90	68,40	68.90		
Hubbard Y/			66.50		
Ironton, Utah C7	66.00	66.50			
Midland C//	66.00				
Minnegua C6	68 88	68.50	69.00		
Monessen P6	66.00				
Neville Is. P4	66.00	66,50	66.58	67.00	71.00
N. Tonawanda 77		66.50	67.00	67.50	
Sharpaville St	66.00		66,50	67.00	
So Chicago R3	66.00	66.50	66.50	67.80	
So. Chicago W8	66.00		66.56	67.00	
Swedeland A2	68.50	68.50	69.98	69.58	
Toledo /+	66.00	66.50	66 S0	67.00	Land Inches
Tray, N. Y. R3	63.80	68.50	69.00	69.50	74.00
Youngstown Y/			65,50	67.00	

DIFFERENTIALS: Add, 75c per ton for each 0.25 pet silicon or portion thereof over base (1.75 to 2.25 pet except low phos., 1.75 to 2.09 pet) 50c per ton for each 0.25 pet mananesse or partion thereof over 1 pet, 52 per ton for 0.50 to 0.75 pet nickel, 51 for each additional 0.25 pet nickel, Add 51.00 for 0.31 0.69 pet phos.

Silver from: Buffale 6 pet), H/J. X79.25; Jackson J/J. 46 (Globe Div.), 378.00, Niagrar Falis (15.01-15.50), \$101.00; Keokuk (14.01-14.50), \$103.50; (15.51-16.00), 3106.50, Add 51.00 per ton for each 0.50 pet silicon over base (6.01 to 6.50 pet) up to 18 pet. Add 51.25 for each 0.50 pet manganese over 1.00 pet. Beasemer silvery pig iron (under .10 pet.); \$64.00. Add \$1.00 premium for all grades silvery to 18 pet. pct phos.); \$64. ailvery to 18 pct.

1 Intermediate low phos

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.00	23.75	23.25	25.25	-	27.00	39.75	32.25	37.00	-	16.75	-	17.00
Stabs, billets	27.00	27.00	28.00	31.50	32.00	33.25	49.50	40.00	46.50	-	21.50	-	21.75
Billets, forging		36.50	37.25	38.00	41.00	40.50	62.25	47.00	55.75	32.00	28.25	28.75	28.75
Bars, struct.	42.00	43.00	44.25	45.00	48.00	47.75	73.00	55,50	64.75	37.75	33.75	34.25	34.25
Plates	44.25	45.00	46.25	47.25	50.00	50.75	76.75	59.75	69.75	40.25	35.00	36.75	36.00
Sheets	48.50	49.25	51.25	52.00	-	55.00	80.75	65.50	79.25	48.25	40.25	-	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	-	44.25	69.25	53.50	63.50	-	31.00	-	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	-	55.00	80.75	65.50	79.25	48.25	40.25	-	40.73
Wire CF; Rod HR	40.00	40.75	42.00	42.75	45.50	45.25	69.25	52.50 52.75	61.50	35.75	32.00	32.50	32.50

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., C11; Brackenridge, Pa., A3; Butler, Pa., A7; Vandergrift, Pa., U1; Washington, Pa., W2, J2. Baltimore, E1; Middletown, O., A7; Massillon, O., R3; Gary, U1; Bridgeville, Pa., U2; New Castle, Ind., 12; Detroit, M2.

Strip; Midland, Pa., CII; Waukegan, Cleveland, A5; Carnegic, Pa., S9, McKeeapert, Pa., FI; Reading, Pa., C2; Washington, Pa., W2; W. Leechburg, Pa., A5, Bridgeville, Pa., U2; Detroit, M2; Canton, Massillon, O., R3; Harrison, N. J., D3; Youngstown, J3; Sharon, Pa., SI; Butler, Pa., A7; Wailingford, Conn., U3; plus further conversion extras); W1 (25¢ per lb higher); New Bedrord, Mass., R6; Carry, U1 (25¢ per lb higher); New Bedrord, Mass., R6; Carry, U1 (25¢ per lb higher);

Bar: Baltimore, A7; S. Duquesne, Pa., UI; Munhall, Pa., UI; Reading, Pa., C2; Titusville, Pa., U2; Washington, Pa., J2; McKeesport, Pa., UI; FI Bridgeville, Pa., U2; Dunkirk, N. Y., A3; Massillon, O., R5, S. Chicago, UI; Syracuse, N. Y., C1I; Watervliet, N. Y., A3; Waukegan, A5; Canton, O., T5, R3; Ft. Wayne, I4; Detroit, R5; Gary, UI; Owenboro, Ky., G5; Bridgeport, Conn., NS.

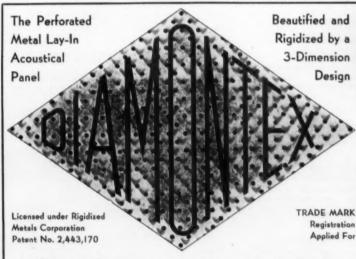
Wite: Waukegan, A5; Massillon, O., R3; McKeesport, Pa., F1; Ft. Wayne, J4; Harrison, N. J., D3; Baltimore, A7; Dunkirk, A3; Monessen, P1; Syracuse, C11; Bridgeville, U2.

Structurals: Baltimore, A7; Massillon, O., R3; Chicago, Ill., J4; Watervliet, N. Y., A3; Syracuse, C11; S. Chicago, U1.

Plates: Brackenridge, Pa., A3; Chicago, UI; Munhall, Pa., UI; Midland, Pa., CII; New Castle, Ind., I2; Middletown; AI; Washington, Pa., J2; Cleveland, Massillon, R3; Coatesville, Pa., CI5; Vandergrift, Pa., UI; Gary, UI.

Forging billets: Midland, Pa., CII; Baltimore, AI; Washington, Pa., J2; McKeespoet, FI; Massillon, Canton, O., R5; Watervliet, A3; Pittaburgh, Chicago, UI: Syracuse, CII; Detroit, R5; Munhall, Pa., S. Chicago, UI; Owensboro, Ky., G5; Bridgeport, Conn., N8.

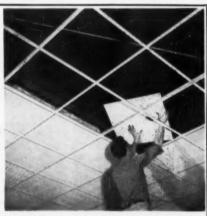
(Effective May 12, 1958)



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... which meets every noise-control requirement in Schools, Hospitals, Restaurants, Food Markets, Bowling Alleys, Work Rooms, Offices, etc. with unsurpassed Appearance, Economy, Efficiency, Incombustibility and Ease of Installation.

A NEW illustrated bulletin, No. 47, gives complete information regarding DIAMONTEX Acoustical Panels and their application to either new or existing buildings. Write, today, for a free copy.



Easily Installed and Removed Versatile and Decorative

The distinctive 3-dimension rigidizing design creates a decorative diamond-shaped pattern on installed DIAMONTEX Panels, which varies 90degrees in direction according to the manner in which the panels are laid in the supporting grid structure, as shown in the illustration above.

Provision is made, also, for applying DIAMON-TEX Panels to existing acoustical ceilings by means of either screws or toggle bolts and a special type of molding which covers the heads of the screws or bolts after they are in place.

DIAMOND MANUFACTURING CO. WYOMING (Wilkes-Barre Area) PA

2

FERROALLOY PRICES		
Ferrockrome Cents per lb contained Cr, lump, bulk, carloads, del'd. 67-71% Cr, 30-1.00% max. Si. 0.02% C. 41.00 0.50% C. 38.00 0.05% C. 39.00 1.00% C. 37.75 0.10% C. 38.50 1.50% C. 37.50 0.20% C. 38.52 2.00% C. 37.25 4.00-4.50% C, 60-70% Cr, 1-2% Si. 28.75 3.50-5.00% C, 57-64% Cr, 2.00-4.50% Si 27.50 0.025% C (Simplex) 36.75 0.10% C, 52-57% Cr, 2.00% max Si. 37.50 7-8½% max C, 50-55% Cr, 36% 22.50 7-8½% max Si 25.00 7-8½% max C, 50-55% Cr, 3% max 25.00	Per gross ton, lump, f.o.b. Palmerton, Pa., and Neville Island, Pa. Manganese Silicon 16 to 19% 3% max. \$100.50 19 to 21% 3% max. 102.50 21 to 23% 3% max. 105.00	Alsifer, 20% Al, 40% Si, 40% Fe, f.o.b. Suspension Bridge, N. Y., per lb. Carloads, bulk
High Nitrogen Ferrochrome	Electrolytic Manganese	plus Ta \$3.80
Low-carbon type 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome max. 0.10% C price schedule. Add 5¢ for each additional 0.25% of N. Chromium Metal Per lb chromium, contained, packed, delivered, ton lots, \$7% min. Cr. 1% max.	F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, f.o.b. Marietta, O., delivered, cents per pound. Carloada 34.00 Ton lots 36.00 250 to 1999 lb 38.00 Premium for Hydrogen - removed metal 0.75	Ferromolybdenum, 55-75%, 200-1b containers, f.o.b. Lankeloth, Pa., per pound contained Mo., \$1.68 Ferrophosphorus, electric, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$4.00 unitage, per gross ton
Fe. 9.10% max. C \$1.31 9.50% max. C 1.31 9 to 11% C, 88-91% Cr, 0.75% Fe. 1.40	Medium Carbon Ferromanganese Mn 80 to 85%, C 1.25 to 1.50, Si 1.50%	Ferrotitanium, 40% regular grade 0.10% C max., f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots,
Electrolytic Chromium Metal Per 1b of metal 2" x D plate (1/4" thick) delivered packed, 99.80% min. Cr. (Metallic Base) Fe 0.20 max. \$1.29	max., carloads, lump, bulk, delivered, per lb of contained Mn	per lb contained Ti \$1.35 Ferrotitanium, 25% low carbon, 0.10% C max, f.o.b. Niagara Falls, N. Y., and Cambridge, O., freight allowed, ton lots, per lb contained Ti \$1.50
Ton lots 1.31 Less ton lots 1.33 Low Carbon Ferrochrome Silicon (Cr 34-41%, Si 42-45%, C 0.05% max.) Carloads, delivered, lump, 3-in. x down, packed. Price is sum of contained Cr and contained Si.	0.07% max. C, 0.06% (Bulk) P, 90% Mn 37.15 33.95 41.15 0.07% max. C 35.10 37.90 39.10 0.10% max. C 34.35 37.15 38.35 0.15% max. C 33.60 36.40 37.60 0.30% max. C 32.10 34.90 36.10	Less ton lots \$1.54 Ferrotitanium, 15 to 18% high carbon, f.o.b. Niagara Falls, N. X., freight allowed, car- load per net ton \$240.00 Ferrotungsten, ¼ x down packed, per pounds contained
Carloads, bulk	Mn, 5.0-7.0% Si 28.60 31.40 32.60	W, ton lots delivered \$2.15 (nominal) Molybdic oxide, briquets per lb contained Mo, f.o.b. Langeloth,
Less ton lots 34.35 17.30 Calcium-Silicon	Silicomanganese Lump size, cents per pound of metal,	Pa
Per lb of alloy, lump, delivered, packed. 20-33% Cr, 60-65% Sl, 3.00 max. Fe. Carloads 25.65 Ton lots 27.95 Less ton lots 29.45 Calcium-Manganese—Silicon Cents per lb of alloy, lump, delivered, packed.	Lump size, cents per pound of metal, 65-68% Mn, 18-20% Si, 1.5% max. C for 2% max. C, deduct 0.2¢ f.o.b. shipping point. Carloads bulk 12.80 Ton lots, packed 14.45 Briquet contract basis carloads, bulk, delivered, per lb of briquet 15.10 Packed, pallets, 3000 lb up to carloads - 16.59	Langeloth, Pa. \$1.38 Simanal, 20% Si, 20% Mn, 20% Al, fo.b. Philo, Ohio, freight allowed per lb. Carload, bulk lump . 18.50¢ Ton lots, packed lump . 20.50¢ Less ton lots . 21.00¢ Vanadium oxide, 86-89% V ₂ Os
16-20% Ca, 14-18% Mn, 53-59% Si. Carloads	Silvery Iron (electric furnace) Si 15.50 to 16.00 pct., f.o.b. Keokuk,	Zirconium, per lb of alloy
Less ton lots	Iowa, or Wenatchee, Wash., \$106.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$93.00.	carloads, packed 27.25e 12-15%, del'd lump, bulk- carloads 9.25e
x 12 mesh. Ton lots 21.15	Silicon Metal	Boron Agents
V Foundry Alloy Cents per pound of alloy, f.o.b. Sus-	Cents per pound contained Si, lump size, delivered, packed, Ton lots, packed packed	Boronii, per lb of alloy del. f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb con- tained B
pension Bridge, N. Y., freight allowed, max. St. Louis, V-5; 38-42% Cr. 17-19% Si, 8-11% Mn, packed.	96.75% Si. 1.25% Fe 24.20 22.90 98% Si, 0.75% Fe 24.95 23.65	2000 lb carload \$5.50 Bortram, f.o.b. Niagara Falls.
Si, 8-11% Mn, packed. Carload lots	Silicon Briquets Cents per pound of briquets, bulk, de-	Bortram, f.o.b. Niagara Falls. Ton lots per pound
Graphidox No. 4 Cents per pound of alloy, f.o.b. Sus-	livered, 40% Si, 2 lb Si, briquets. Carloads, bulk	Corbortam, T1 15-21%, B 1-2%, S1 2-4%, A1 1-2%, C 4-5-7.5%, f.o.b., Suspension Bridge, N. Y., freight allowed. Ton lots per pound 14.00¢
pension Bridge, N. Y., freight allowed, max. St. Louis, Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%. Carload packed 19.20 Ton lots to carload packed 21.15 Less ton lots 22.40	Electric Ferrosilicon Cents per lb contained Si, lump, bulk, carloads, f.o.b. shipping point. 50% Si	Ferroboron, 17.50 min. B, 1.50 % max. Sl, 0.50 % max. Al, 0.50 % max. C, 1 in. x D, ton lots \$1.20 F.o.b. Wash., Pa., Niagara Falls, N. Y. delivered 100 lb.
Ferromanganese Maximum base price, f.o.b., lump size, base content 74 to 76 pet Mn.	50% SI 14.20 75% SI 16.40 65% SI 15.25 85% SI 18.10 90% SI 19.50	14 to 19%
Producing Point Cents Marietta, Ashtabula, O.: Alloy, W. Va.: Sheffield, Ala.; Portland, Ore. 12.25	Ferrovanadium 50-55% V delivered, per pound, contained V, in any quantity. Openhearth 3.20 Crucible 3.30	Grainal, f.o.b. Cambridge, O., freight, allowed, 100 lb and over No. 1
Johnstown, Pa. 12.25 Neville Island, Pa. 12.25 Sheridan, Pa. 12.25 Philo, Ohio 12.25 S. Duquesne 12.25	High speed steel (Primos) 3.40 Calcium Metal	Manganese-Boron, 75.00% Mn, 15.20% B, 5% max. Fe, 1.50% max. Sl, 3.00% max. C, 2 ln. x D, del'd. Ton lots (packed)
Add or substract 0.1c for each 1 pct Mn above or below base content. Briquets, delivered, 66 pct Mn:	Eastern zone, cents per pound of metal, delivered. Cast Turnings Distilled Ton lots\$2.05 \$2.95 \$3.75	Less ton lots (packed) 1.57 Nickel-Boron, 15-18% B. 1.00% max. Al. 1.50% max. Si, 0.50% max. C. 3.00% max. Fe, balance
Carloads, bulk	Ton lots \$2.05 \$2.95 \$3.75 100 to 1999 lb 2.40 3.30 4.55 (Effective May 12, 1958)	Ni, del'd less ton lots 2.15

(Effective May 12, 1958)

9

1)

1



Hundreds of installations over the past few years have proved the economy of the only hardness tester which combines all scales of Rockwell Test (15 to 150 kg. loads). The Kentrall cuts costs because it does the job of two conventional testers, requires only half the space and maintenance. Write for more detailed information, plus a list of prominent users who have switched to Kentrall.

PRICE \$750.

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"DAVIS" KEYSEATER

Low in Cost. Durable. Easy to operate. Table adjustable for straight or taper keyways Two sizes. Keyways 1/16" up to 1".

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FOR PERFECT SOLDERING IN LESS TIME

Use Rubyfluid soldering flux. Fast acting . . . easy to use . . wets out freely . . insures strong unions. Ask your jobber or write for special \$1.00 offer.

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- · round, slot and decorative designs, staggered and straight row arrangements;
- e stainless and carbon steel, monel, copper, brass, bronze and aluminum;
- thicknesses from .003" to .375"; hole sizes from .020".

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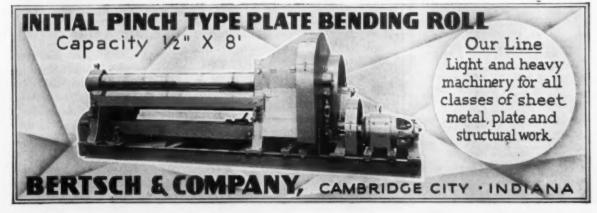
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ZINC ACCURATELY ROLLED

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THE IRON AGE, May 15, 1958

GUARANTEED RE-NU-BILT **ELECTRIC POWER EQUIPMENT** DC MOTORS Make Тура MCF QM MCF MPC CB-207.4 SK-190 CDBB 65-H SK-185 SK-181 CD-1231 MD-412-1 Whse. G.E. Cr. Wh. Whse. Rel. BB MG SETS 2000 1750/2100 1500 1000 750 500 500 350 Make Whee, G.E. auto G.E. G.E. G.E. Kuhl Meloney Voltages Vertages 13800 x 2300 4000/4200/4400 2400 x 480 13800 x 230/460 4800 x 83/55 Marcus Auto-air 8 208/220 OISC 100 G.E. BELYEA COMPANY, INC.

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47 Howell Street, Jersey City 6, N. J.

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Used - As Is - Reconditioned

RAILWAY CARS All Types

SERVICE-TESTED FREIGHT CAR REPAIR PARTS

For All Types of Cars LOCOMOTIVES

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SPECIAL STANDARD GAUGE CARS
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10-70 fon Capacity

ORE HOPPER CARS 660 Cubic Feet 40- and 50-Ton Capacity

SIDE DUMP CARS 6-Air-operated, Austin-Western 30-Cubic Yard 3 Drop and 3 Lift Door Type

RAILWAY TANK CARS and STORAGE TANKS

6,000- 8,000- and 10,000-Gallon Cleaned and Tested

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"ANYTHING containing IRON or STEEL"

THE CLEARING HOUSE

Sales Hustle Helps Cleveland Dealers

Used machinery salesmen are pulling out all the stops to bring in business.

In some cases customers now find it easier to finance their purchases.

"The Ohio used machinery business can be summed up in a single sentence," one salesman says. "You can peddle anything in good condition made since 1950."

His statement crystallizes sentiments of other area dealers. They are finding the answer to the recession is to get up and make calls and the calls are getting results. The old pros who have not forgotten how to sell are bringing in the results and the newer salesmen are learning lessons daily.

Money Less Tight - Another contributing factor is that banks are loosening the purse strings since changes have been made in the rediscount rate. In some instances they have been reported actually out soliciting loan customers-occasionally those turned down a few months ago.

Psychologically too, as new machine tool salesmen are finding, the first shock of the recession brought an automatic reflex by company officials to turn down capital expenditures. But they are now adjusted to recession levels and are looking for cost cutting tools.

Get Out and Sell-"We have had a definite pick-up in the last 2 or 3 mos." says Allen Price, Cleveland machinery dealer. "Last year it

dropped off sharply when the recession impact hit business. But now it has picked up considerably, especially for the dealers who are out making the calls and not waiting for the telephone to ring."

Most wanted tools in Ohio are standard machine shop items rather than specialty tools or high production types. Lathes, taps, punch presses and the like lead the parade.

Auction Prices Still Up-Prices at auctions are still too high to be attractive to many dealers. Reason most commonly advanced is that there is still a definite shortage of good used machinery. Most good units offered are moving well and command above-normal prices.

Another source of machinery coming into prominence is plants liquidating surplus tools to get the cash. In many cases better than normal machinery is offered dealers this way because it's the only type which will bring in the amount of cash plants are after. In many cases too, several older machines will be liquidated to make room for newer. more versatile types.

Sales Dip Again

Dollar sales of used machinery declined again in March by 12.8 pct below February levels, according to the Machinery Dealers National Assn. February had shown a very slight drop from January which was the best month the industry had since last July.

March reports also reveal that dealer inventories are down, both in number of units and their value.

CONSIDER GOOD USED EQUIPMENT

ANGLE BENDING ROLL

B X 3 X %" Buffalo No. 1 Angle Bending Roll

BALER

Model #123-PX-69 Logemann, Baling Chamber 60

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100	800	Whae.	F. Vent.	143/168
1	700	Whae.	F. Vent.	300/700
1	600	Whse.	M111-R.B.	110/220
940	600	Al.Ch.	MIII	200/600
1	490	G.E.	Ped. Brg.	450
1	300	Whae.	MIII	300
2	275	Whan.	Mill-QM	425/830
1	190	G.E.	MPC	400
1	175	G.E.	CD-175-A	830/1025
1	1.25	G.E.	MPC	488
1	125	Whee.	SIC-184	575/850
1	100	G.E.	CD-175	400/800
1	100	Rel.	461-T	1150/1500
1	88	El. Dy.	23-8	525/1050
1	80	Rel.	651-T	573/1150
1	30/60	Whae.	8K-131	500/1500
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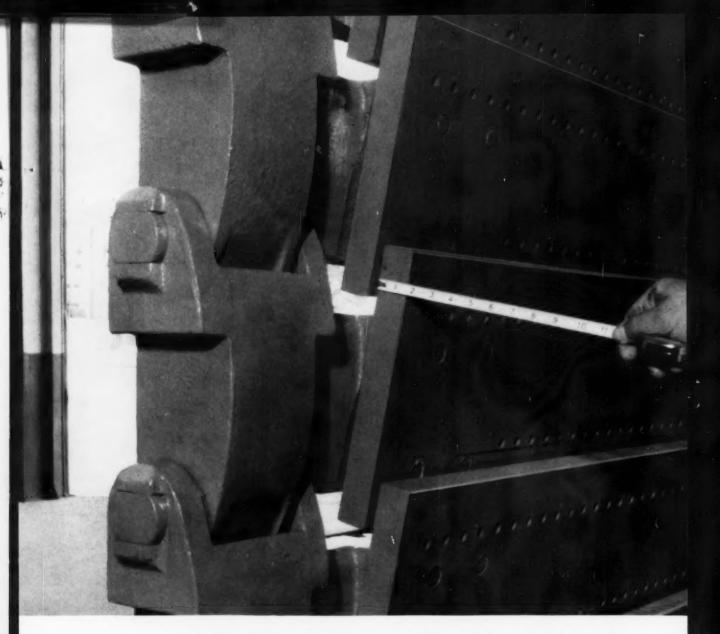
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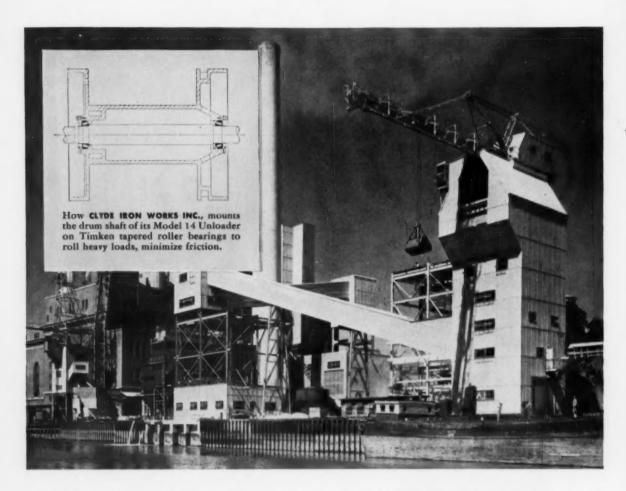
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